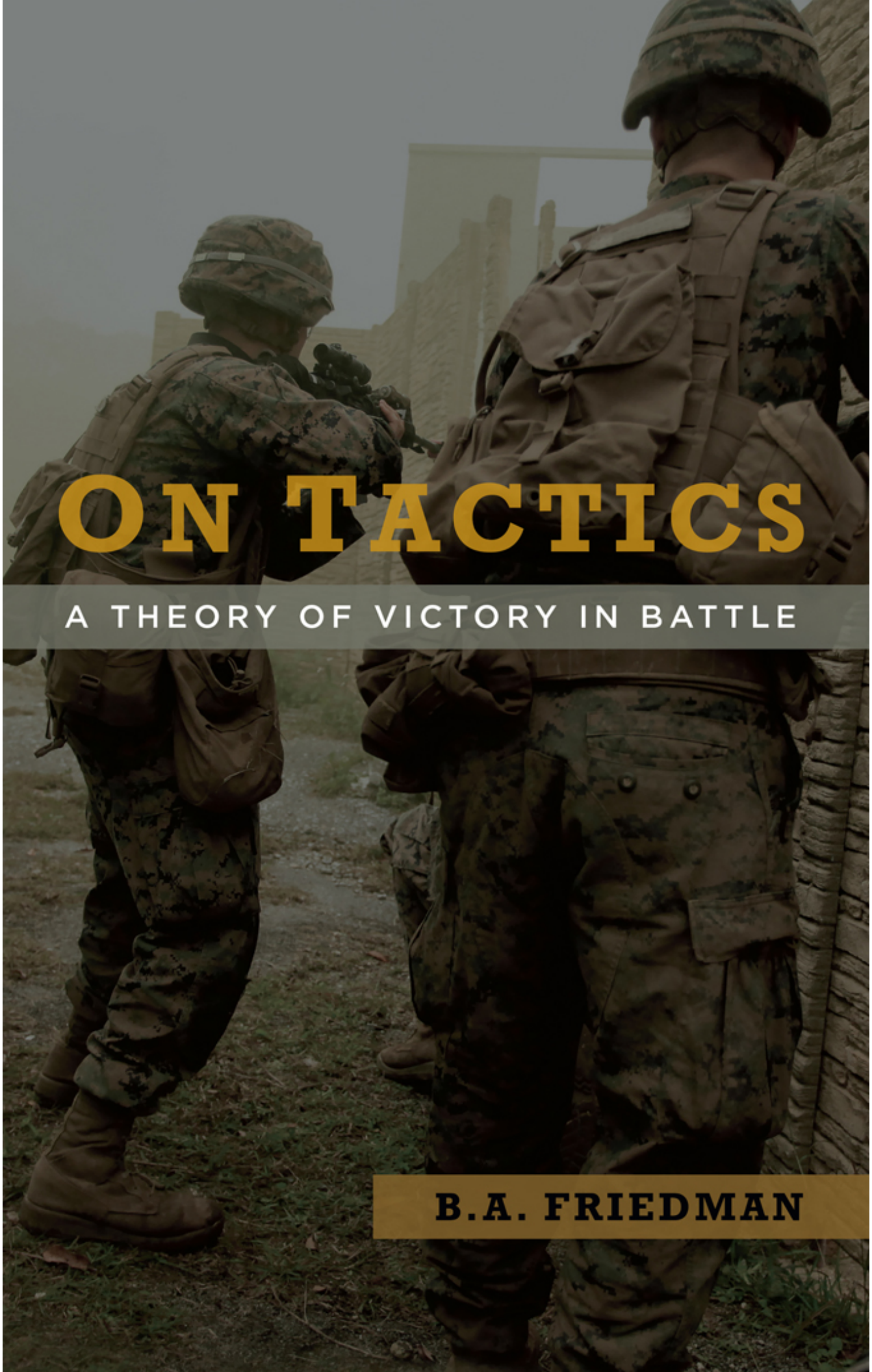
ON TACTICS
A THEORY OF VICTORY IN BATTLE
B.A. FRIEDMAN

On Tactics

On Tactics

A THEORY OF VICTORY IN BATTLE

B. A. FRIEDMAN

NAVAL INSTITUTE PRESS
Annapolis, Maryland

Naval Institute Press
291 Wood Road
Annapolis, MD 21402

© 2017 by B. A. Friedman
All rights reserved. No part of this book may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage and retrieval system, without permission in writing from the publisher.

Library of Congress Cataloging-in-Publication Data
Names: Friedman, B. A., author.
Title: On tactics: a theory of victory in battle / B.A. Friedman.
Description: Annapolis, Maryland: Naval Institute Press, 2017. | Includes bibliographical references and index.
Identifiers: LCCN 2016059034 (print) | LCCN 2016059857 (ebook) | ISBN 9781682471647 (ebook)
Subjects: LCSH: Tactics.
Classification: LCC U165 .F83 2017 (print) | LCC U165 (ebook) | DDC 355.4/2—dc23
LC record available at https://lccn.loc.gov/2016059034

Print editions meet the requirements of ANSI/NISO z39.48-1992 (Permanence of Paper).

25 24 23 22 21 20 19 18 17 9 8 7 6 5 4 3 2 1
First printing

CONTENTS

Preface

1 On Theory and Tactics
2 The Tactician's Task

Part I: Tactical Tenets

3 Maneuver
4 Mass
5 Firepower
6 Tempo
7 Deception
8 Surprise
9 Confusion
10 Shock
11 Moral Cohesion

Part II: Tactical Concepts

12 The Culminating Point of Victory
13 The Offense, the Defense, and the Initiative
14 Command and Control
15 Environment and Geography
16 Crossing the Bridge: Linking Tactics with Strategy
17 Conclusion

Appendices

A The Principles of Planning
B The Operational Level of War
C The Center of Gravity
D Conventional vs. Guerilla Warfare
E Training and Education
F Philip's Gift: The Organization of Tactically Successful Militaries

Notes
Glossary
Bibliography
Index

PREFACE

This book is a rectification. I have been a practitioner of military tactics for sixteen years and a student of strategy for roughly five years. The latter is far easier, and not for the obvious reasons. The student of strategy, once he realizes the importance of the concept, has a well-organized field in which to plant the seeds of his intellectual development. (Unless otherwise stated, whenever the masculine gender is used, both men and women are included.) The furrows are straight and parallel, the plow is sharp and ready, and even the fallow fields are clearly defined. The study of tactics offers no such easy introduction. The fields are unseen, buried beneath tangled undergrowth, thorny bushes, and towering trees. A chaotic mix of overgrown strategic theory, dense doctrine, and of course military history hides the underlying nature of tactics. Unlike strategy itself, there is no organizing structure such as that provided by Carl von Clausewitz's *On War* (1976/1832). This work is an attempt to provide that structure or at least the beginning of one. I have endeavored to meet that very theorist's goals for any theory:

> Theory will have fulfilled its main task it used to analyze the constituent elements of war, to distinguish precisely what at first sight seems fused, to explain in full the properties of the means employed and to show their probable effects, to define clearly the nature of the ends in view, and to illuminate all phases of warfare in a thorough critical inquiry. Theory then becomes a guide to anyone who wants to learn about war from books; it will light his way, ease his progress, train his judgment, and help him to avoid pitfalls.[1]

Strategic theory organizes what a practitioner learns by teaching him not what to do in war but how to think about war. This is what I have endeavored to do not for strategy but for tactics, a subset thereof. To my knowledge, an attempt to codify tactics in this manner has not been attempted before. Most writers who have written about the principles of war, including Ferdinand Foch, J. F. C. Fuller, and myriad others, have attempted to turn tactical insights into strategic principles vice tactical ones.

I have eschewed a focus on technology for two major reasons. The first is that I agree with Steven Biddle that it is a poor predictor of victory (above the level of an individual). The second reason is that whole books could be—and have been—written about the interaction of tactics and technology. These days, such books are outdated before they are printed. Applying tactical principles such as those presented here to specific technology is the role of doctrine, most of which is continually updated for just this reason. I do not deny the influence of technology on tactics—I just choose not to focus on it in this book.

Clausewitz believed that any theory of war must address its threefold nature: passion and enmity, probability and chance, and subordination to the rational. Although this work is not a theory of war I believe it passes this test: the primacy I have placed on the moral sphere, the presence of probability throughout, and the subordination of tactics to strategy are parallels directly derived from Clausewitz's trinity.

Due to the nature of tactics as simultaneously the base of and servant to strategy, it is impossible to construct or discuss a theory of tactics without strategy. Strategic ideas are thus interspersed throughout the text where they are relevant. I believe such a mixture is necessary and it supports the idea that strategy and tactics are intimately related, but it does not mean that a tactical system cannot be developed. It can, but just not in a vacuum of strategy. It will also serve to introduce unfamiliar readers to strategic concepts. This is another reason for its length. This work is short by design. It is meant to be read primarily by the practitioner while also being accessible to the layman. Academics and experts have the training and time necessary to evaluate a long treatise filled with reams of examples and counterexamples. Corporals and lieutenants do not. It is meant to be a simple, easy, but useful base that will serve as such for a time until the corporal and the lieutenant become the sergeant major and the colonel,

when a deeper study of warfare will be ideal. It solves the problems that I, looking back, have seen both in my professional training as a tactician—first in the infantry and then in the artillery—and in my academic pursuits in strategic studies. I have written the book I wish someone had handed to me as a young non-commissioned officer as I prepared to assume the duties of an officer.

While the sinews of war may be infinite funds, the sinew of tactical prowess is a common outlook, one that contextualizes and unifies doctrine, history, and experience across a military force. One cannot standardize everything, especially experience. But one can instill in troops a common outlook that they will use to analyze doctrine, history, and the experience they gain. This book is not intended to provide a guide in how to win in a specific situation, but instead to introduce a common set of terms and a cognitive framework for evaluating and analyzing past events and future plans. This is all that theory can provide, and no theoretical system is foolproof. The final gap between theory and practice can never be bridged. The crossing is necessarily a leap of faith through the danger and fear of combat. This system applies to the tactics of military units, however small, except the individual, whether that individual be a soldier, warrior, ship, or aircraft. The tactics of a duel, like the duel of the *Bismarck* and the *Hood,* fall outside the scope of this work. Modern discussions of tactics usually use the phrase "tactics, techniques, and procedures." This is unfortunate: the first word has little if anything to do with the second and third. This book applies only to the first.

In constructing a theory of tactics, concepts are the rafters but the nails and joints are necessarily historical examples. That being said, I am not a historian. I have used the work of many fine historians in this book but cannot count myself among them. If I have erred in interpreting the historical record, the fault is solely mine and not that of my sources.

A theory of tactics must be timeless and applicable to any battle, anywhere, anytime. On some level, military professionals have known this for years. Tacticians have continually studied the Battle of Cannae ever since it took place, on the second day of August 216 BC; the battle even served as the inspiration for the Schlieffen Plan: Germany's attempt to defeat France quickly and easily in the early days of World War 1. (The plan was named for Count Alfred von Schlieffen, the German officer who

designed it.) The battle has appeared in many books on war over the centuries, and this book will be no different.

I have to thank my parents: my dad Bob Friedman for the use of his extensive military history library since I was fourteen and my mom Gigi Friedman for her early writing lessons. This book would not be possible without my wife, Ashton, who most importantly did not laugh when I told her about it and never lost faith in it thereafter. Maj. Jon Wilkins, United States Marine Corps, lent me his expertise in infantry tactics, read the first complete manuscript, and was kind enough to give it a passing grade on a sanity check. Of course, I must thank the Naval Institute Press for their continuing commitment to naval and military literature and for taking two chances now on my writing. They have a remarkable team of talented and kind people, especially Glenn Griffith, Judy Heise, and Claire Noble.

When I was a lieutenant one of my reporting seniors wrote in a fitness report that I was destined to be an intellectual leader in my field. The reviewing officer disagreed and stated that it was impossible to identify such a trait in any lieutenant. It was just the right amount of faith and the lack thereof to combine into motivation. Thus, they both contributed to this work.

The aforementioned reporting senior was Maj. Wayne Ricardo “Rick” Hunte, United States Marine Corps. He retired in 2009 and passed in January 2016. Rest in peace.

1

ON THEORY AND TACTICS

> For all the "4th Generation of War" intellectuals running around today saying that the nature of war has fundamentally changed, the tactics are wholly new, etc., I must respectfully say, "Not really": Alexander the Great would not be in the least bit perplexed by the enemy that we face right now in Iraq, and our leaders going into this fight do their troops a disservice by not studying—studying, vice just reading—the men who have gone before us. We have been fighting on this planet for 5,000 years and we should take advantage of their experience.
>
> —Gen. James Mattis, USMC, November 20, 2003

There has never been a true tactical theorist. Although the giants of strategic theory touched on tactics, their focus was always on strategy. Tactics in general has been viewed as too technical a subject for theory, and the mechanistic movements of troops and material as too scientific to catch the theorist's eye.

But tacticians know otherwise. It is said that war is both an art and a science. The tactician knows he is an artist. The inherent probability and chance of warfare and the pervasive moral factors defy the scientist's methods. Certainly, science occurs on the battlefield. The sniper calculates wind speed and direction when planning his shot. The machine gunner knows how far his bullets can fly and be effective. The artilleryman uses

ballistics to guide the shell straight and true. But the application of that science takes an artist's mind. The painter does not make his brushes or his canvas, but he turns the science behind their production into art. As technical as his tools are, the tactician is not a technician.

To assist him in his artistry, the tactician can draw on three sources: doctrine, his own experience, and the experience of others gained through the study of military history.

Being an art, tactics eludes codification. Military organizations attempt to codify tactics into doctrinal manuals that amount to little more than technical lists of specific tactics for specific situations. Doctrine is used as a rulebook but, as the Prussian theorist Carl von Clausewitz said "Pity the soldier who is supposed to crawl among these scraps of rules, not good enough for genius, which genius can ignore, or laugh at."[1] What is missing in military doctrine is context and the context is everything to the tactician. Doctrine, however, cannot be produced for every situation and every locale in which a military force might be employed. Doctrine is useful because it is tactical tenets applied to the specific weapons, technology, and structure of a specific military organization for a specific situation.

The tactician's own experience is sometimes the surest guide, but humans can gain only so much experience, and the novice tactician is deprived of this resource. Military history can act as a stand-in, and we have thousands of years of past experience to draw from, but how is the tactician to digest and reach true understanding of these various sources?

The answer is theory. Effective strategic theory can give us a way to test and analyze that which cannot be tested through the application of the scientific method. We cannot recreate, for example, the Napoleonic Wars and change this or that variable in order to test whether that variable is decisive to the outcomes or not. Were the wars the result of societal changes within France or the product of Napoleon himself? No laboratory can recreate the conditions necessary to test that question. We can, however, make an educated guess and then test it against a body of theoretical knowledge as an admittedly inferior stand in for such a laboratory. In the words of J. C. Wylie, "[theory] is orderly rationalization of real or presumed patterns of events . . . [that can] help the practitioner to enlarge his vision in an orderly, manageable and useful fashion—and then apply it to the reality

with which he is faced."[2] If doctrine, history, and experience are three bricks with which the practitioner can build his skill as a technician, theory is the mortar that holds them together.

This organization and definition of terms, concepts, and ideas is routinely done in the strategic theory community, and such theories are readily available. Tactical theory, however, is thus far formless, chaotic, and inconsistent. It is usually boiled down to a list of principles. Each military organization seems to have its own favored list of principles. The tactician knows, however, that these principles are not immutable. Some can be contradictory if employed simultaneously and others are overturned in execution by geography, situation, context, and of course strategy. Most militaries say that the principles are not intended to be a checklist when they are presented in doctrine, but recruits and cadets continue to memorize them as such.

Before examining tactical theory, however, one must start with a base of strategic theory. Clausewitz divided warfare into tactics, actual combat between opposed military forces, and strategy, the latter being the overarching plan for using tactical engagements to achieve the ends as set forth by policy. Each tactical action contributes to the general course of a war. The strategy acts as a bridge between the tactical actors (military forces) and the desired political end state of the entity those forces serve.[3] The strategy is frequently expressed as the arrangement of ends, ways, and means. Tactics are therefore subordinate to strategy, although the bridge must be a two-way thoroughfare where feedback from tactical actors informs the decisions of policymakers. A good example occurred during the Iraq War when strategic concerns prompted U.S. policymakers to change the tactics of U.S. armed forces in Iraq by implementing counterinsurgency operations established in a new doctrinal publication, *FM 3-24 Counterinsurgency.*[4] The desired political end state, a more stable Iraq, required a modification of the way in which tactical actors operated, chose, and executed tactics in theater.

The division between strategy and tactics is therefore theoretical: there is no true division because strategy is made up of tactics and tactics are chosen or modified based on strategy. Or at least they should be chosen based on strategy. Tactics that do not serve strategy are wasteful at best and

counterproductive at worst. Where the true division lies is between the actors, between the boots on the ground and the leadership at upper echelons or even across the globe. It is incumbent on the tactician to choose tactics that serve the strategy, and it is incumbent on the strategist to lay out a clear, realistic, and appropriate strategy to guide the tactician in his choices. Combat is, as Clausewitz said, the most effective way to win but it is only a "means to an end."[5] The tactician must always keep the end in sight even as he employs the means.

The strategy and tactics dynamic of Clausewitz provides us with a way to think about war and provided the Prussian with a means to explore strategy. His method for thinking about war has endured for well over a century and is still the dominant theory in strategic studies. There is no real equivalent for tactics. While all of the great strategic theorists certainly discussed tactics, their focus was always on strategy. Strategy enjoys a wealth of exposition from which the strategist can gain insight, whereas tactics is a poorly organized field.

Tactics is so amorphous a study because it lacks a generally accepted theory. Clausewitz's ideas on tactics, for example, are largely outdated and overshadowed by his monumental strategic ideas contained in *On War* despite his belief that it was easier to formulate a theory for tactics than for strategy. The reason for this lies in the use of theory: "Theory will have fulfilled its main task when it is used to analyze the constituent elements of war, to distinguish precisely what at first sight seems fused, to explain in full the properties of the means employed and to show their probable effects, to define clearly the nature of the ends in view, and to illuminate all phases of warfare in a thorough critical inquiry. Theory then becomes a guide to anyone who wants to learn about war from books; it will light his way, ease his progress, train his judgment, and help him to avoid pitfalls."[6]

In other words, theory acts as a paradigm: an accepted method of thinking about a subject. It provides that laboratory in abstract that cannot be created in reality. Strategic theory assists the strategist in evaluating military history, situations with which he is presented, and information gleaned from experience. The tactician needs such a system as well to assist his study of history, doctrine, and his own experience. There is an ample body of theory for war, but there is little in the way of a theory of warfare,

which "comprises everything related to the fighting forces."[7] Most works of military theory look down on the field of tactics from the mountaintops of strategy. This work is the inverse. It will look around the battlefield, but will also describe a view of the surrounding strategic heights.

The Principles of War

The most common system in use for the tactician to use in evaluating the various sources of tactical advice at his disposal is a list known as the principles of war. Although there are a few principles that seem to make an appearance on nearly every list, there is no one definitive list. Perhaps the earliest example of tactical recommendations arranged in such a manner is Napoleon Bonaparte's list of six: objective, mass, offensive, security, surprise, and movement.

The most influential theorist to codify principles of war was, unsurprisingly, Clausewitz. He did so in two works. First, he used them in his *The Most Important Principles for the Conduct of War to Complement My Instruction to His Royal Highness the Crown Prince,* a pamphlet written when Clausewitz was tutor to the crown prince of Prussia as advice to the future ruler.[8] Second, he revised them and included chapters on some of them in *On War,* which he wrote later in his life.

In *Principles,* Clausewitz wastes little time with discussion but immediately presents the reader with the factors that must be taken into account for a theory of warfare. These include physical, material, and moral factors. In the first section, he refers to tactics as the "theory of combat."[9] In this early work, he has already adopted the division between a theory of tactics and a theory of strategy. Although this work is replete with ideas that will later appear in *On War,* it is far less organized than the later work. Various tactical recommendations appear throughout, but are not organized around the later terms he will use in *On War.* Even so, it is easy to see the germinating seeds of later concepts such as mass and economy of force.

Although Clausewitz never finished *On War,* it is the final distillation of his ideas. Some of the principles are most recognizable in Book 3 titled, "On Strategy in General," but the principles in use today could be almost entirely derived from this chapter and other selections from *On War.*

Maneuver, for example, appears later. The indirect approach, a concept that would later form the entire strategic conception of British theorist Sir Basil Liddell Hart, is pithily summed up in one paragraph of Clausewitz's book.[10]

Although Clausewitz has been accused of being the Mahdi of mass, that is not even his first principle—that place belongs to boldness. Clausewitz's ideas on each of his principles will be discussed at greater length in later chapters but it is important to point out that his principles were not merely scientific or physical and that principles cannot be used as a checklist or strict recipe. In the words of Jon Sumida, "Clausewitz recognizes the existence of principles of war, such as concentration of force, but he uses them as points of reference rather than standards of measure. In other words, the proper use of principles is to facilitate the understanding of the character of particular situations, not to serve as general instructions for action."[11]

In the twentieth century French general Ferdinand Foch published a book titled *The Principles of War* (first published in 1903). Foch's system consisted of four major principles: economy of power, freedom of action, free disposal of power, and protection.[12] Although Foch's ideas were popular before World War I, his system seemed less relevant after that conflict.

Despite their earlier appearance, the true father of the principles as we know them today is J. F. C. Fuller. In his work *The Foundations of the Science of War,* Fuller made the principles the centerpiece of his strategic vision.[13] His list went through several formulations during his career, but he eventually settled on direction, concentration, distribution, determination, surprise, endurance, mobility, offensive action, and security. Importantly, he divided his principles along what he alternately called "the Threefold Nature of Man" or the "the Threefold Organization of Man."[14] This threefold organization was physical, mental, and moral: that is, man consisted of a body, a brain or mind, and a soul. Fuller then presented principles of the physical sphere, principles of the mental sphere, and principles of the moral sphere. After Fuller's codification, lists of the principles of war proliferated, although many different versions were

produced. What did not proliferate was his conception of the principles along physical, mental, and moral lines.

Along with their continued use by theorists, the principles have made their way into the military doctrinal publications of nearly every military since Fuller's time. The lists simultaneously show wide variety and remarkable consistency. Mass, for example, appears on nearly every list although it is sometimes referred to as concentration or depth. Surprise is another common principle as well as various forms of economy—of force, of effort, and so on. The problem with the various lists that appear in doctrine is a typical lack of discussion about how the principles work. Each is described, but the underlying logic is usually missing. The principles are therefore presented more as a checklist ready for memorization rather than an analytical device such as Clausewitz intended. Astonishingly, in *JP-1 Doctrine for the Armed Forces of the United States,* the principles of war are presented in a diagram without a single word of exposition or explanation.[15] Not even definitions of each principle are presented. The nature of the principles is lost and no context is offered to help tacticians understand their use. Adm. J. C. Wylie, in his book *Military Strategy,* called the use of the principles as rules as "logical nonsense" and wrote, "Worship of any such patter as the 'principles of war' is an unaware substitution of slogan for thought, probably brought about by the intellectual formlessness that must inevitably exist when there is no orderly and disciplined pattern of fundamental theory from which one consciously or unconsciously takes departure."[16] The lack of a theoretical tactical system produces this confusion and makes the principles all but useless.

Another problem with the principles of war post-Fuller is their inflation. The principles used by Napoleon and others and put forth by Clausewitz and his successors were methods used to defeat the enemy on the battlefield. They were simple and few. As time went by, more and more were added and the principles began to encompass more than just defeating an enemy in battle, making them less and less useful to the tactician. Eventually the U.S. military added joint principles that are of import to the strategist but of little use to the tactician.[17] Too many principles are posited with too little amplifying information.

The confusion caused by this feast and famine presentation along with their continual inflation is evident in Robert Leonhard's *The Principles of War for the Information Age.* In it, Leonhard weighs the doctrinal principles of war in use by the U.S. Army at the time and finds them wanting: "We point to successful armies that didn't mass, and we claim that they 'massed effects.' We consider victorious warriors who won while on the strategic defense, and we point to their occasional use of offensive tactics to prove the efficacy of 'Offensive.' We view the enormous complexity of Operation Just Cause or Desert Storm and yet claim that they were true to the principle of 'Simplicity.' We point to disunited, successful armies as proof of 'Unity of Command.' We permit the most dull-witted frontal attack to prove 'Maneuver.' . . . As long as they work."[18]

Leonhard then proceeds to lay out a vision of a revolution in military affairs (RMA) and dismisses the principles as too old and thus no longer relevant, replacing them with new principles based on his expectation of a change in the nature of war based on the information revolution.

Leonhard's frustration is a function of how he and many others think about the principles. Leonhard expects a scientific, mechanical application of the principles: Mass + Maneuver = Victory. If these principles do not work in this simplistic manner, then they should be discarded. Yet not even Jomini, whom Clausewitz criticized for attempting to apply immutable scientific principles to war, claimed that the principles operate as Leonhard expects them to operate.[19]

Leonhard's RMA never occurred. Or if it did, it was quickly beheaded by a warrior in sandals holding an AK-47 and fighting for the return of a seventh-century caliphate. What he and other theorists missed is the underlying timelessness of Clausewitz's framework, which included the overriding power of moral forces and the pervasive presence of probability and chance. This tradition was continued by theorists such as Ardant du Picq and J. F. C. Fuller, but many theorists such as Leonhard and the technology-focused militaries of the post–Industrial Revolution era forgot the essential moral nature of combat and leaned toward a more scientific and geometrical conception of tactics along the lines of Jomini.

One exception to that trend is Col. John Boyd, United States Air Force. Boyd is better known for other ideas, but a central part of his conception of

strategy is the use of Fuller's physical, mental, and moral spheres. Boyd believed that one must attack the enemy on all three of these planes simultaneously.[20]

Physical represents the world of matter–energy–information all of us are a part of, live in, and feed upon.

Mental represents the emotional/intellectual activity we generate to adjust to, or cope with, that physical world.

Moral represents the cultural codes of conduct or standards of behavior that constrain, as well as sustain and focus, our emotional/intellectual responses.[21]

Boyd believed that any organization, military or otherwise, must interact with its environment on a physical, mental, and moral basis and that achieving victory in war requires that the enemy be physically, mentally, and morally isolated from this interaction. The physical, mental, and moral spheres will be explored in greater detail later, and our concern is strictly with Boyd's ideas at the tactical level, but suffice it to say that Boyd continued and indeed expanded on Fuller's threefold nature idea when it comes to combat.

Boyd is better seen as a member of the artistic school of theorists that include Sun Tzu, Clausewitz, du Picq, Fuller, and others rather than a more scientific school. To be sure, both the artistic school and the scientific school blend together at points. Clausewitz's *On War* is highly scientific in its conception, as were Boyd's presentations; even Jomini eventually admitted the importance of moral factors in combat. The distinction is important because the art/science duality of war is essential to understanding the nature of the principles of war.

The division is typified by the major doctrinal developments of the 1990s and early 2000s. On one hand, many theorists believed that the information revolution would bring about an RMA, as mentioned above. The essential ideas of the RMA were that technology—specifically ever developing communications technology, digitization, and the use of unmanned aerial vehicles—would obviate the "fog of war" and probability and chance. The RMA's tactical expression was effects-based operations or network-centric warfare. Another group of thinkers believed that the uncertainty and probability in war could not be obviated through

technology, but believed that their effects could best be mitigated through decentralized decision-making and training combat forces to out maneuver —rather than simply destroy—enemy forces. This approach is exemplified by *MCDP: 1: Warfighting,* the capstone U.S. Marine Corps Doctrinal Publication (MCDP).

Like war itself, combat has an immutable nature. It remains, underlying the actions of combatants across the centuries. Combat is a contest between people or groups of people intent on destroying each other. It is violent, tragic, horrifying, and exhilarating. It follows that theory must account for the nature of combat across the centuries as well.

While the nature of combat does not change, its character does. Clausewitz compared war to a chameleon whose outward appearance changes despite the fact that it remains a chameleon. Warfare shares this dynamic, which explains why the ambush was an effective tactic in the ancient world and remains so today. In 340 BC, on the island of Sicily, a Carthaginian army comprising their most elite troops was marching toward Syracuse, a Greek colony in southeastern Sicily. The Syracusans ambushed the Carthaginians in a narrow defile from high ground while the latter were attempting to cross a river. The Carthaginians were annihilated.[22] Today, the ambush is the preferred tactic among the Taliban in Afghanistan and other insurgents around the world. The underlying principles that make the ambush effective—surprise, maneuver, firepower, and mass, to name a few —are of warfare's timeless nature even though the character of the ambushes changes. Javelins and arrows were exchanged for rifle bullets and rocket-propelled grenades, but ancient Syracusans and modern Pashtuns use the same ideas to win tactical engagements.

The Nature of the Principles: Principles of Battle

There are several essential concepts of the nature of warfare to understand how the principles work.

First, they are not principles of war at all. In fact, they are more accurately called principles of battle. Antulio J. Echevarria II writes, "A way of war implies a war focus, which in turn necessitates a holistic view of conflict, one that grasps how—in the atmosphere of violence that is war—political, social, economic, and military activities may contribute to, or

detract from, the accomplishment of preferred ends."[23] The principles are far too simplistic to be applied to war as a whole. It follows, then, that they are principles of tactics.

The principles would be even more useful if they were restricted further. Some of them are not tactics but simply pervasive good ideas. A tactical engagement is not won through simplicity, although it is generally a good idea to utilize simple plans where appropriate. A complex plan that arranges numerous tactics may defeat a simple plan. For example, a solid defensive scheme that utilizes mass, depth, and interlocking firepower is an exceedingly complex undertaking. A direct assault of such a defensive scheme, while simple, is almost sure to fail if the defenders are adroit enough in their execution. This does not mean the principles should be discarded, but it does imply that our modern conception of them is flawed.

Probability and Chance

One of the most important ideas put forth by Clausewitz in *On War* is the pervasive presence of probability and chance in war. In fact, in his three-part conception of war—known as the trinity—probability and chance are the second. He also mentions that probability and chance "mainly concerns the commander and his army."[24] Tactical deployments can never be a sure thing. Military history is replete with examples of outnumbered or outgunned forces winning battles and engagements that, on paper, they should not have been able to win.

This idea's application for the principles is key. The utilization of tactical principles such as mass or surprise raise the probability of success but they do not guarantee it. Combining more than one principle raises the probability of success exponentially. It is, however, important for tacticians and strategists to realize that 100 percent probability is an impossibility. Niccolò Machiavelli, a Renaissance-era theorist, used the Roman goddess Fortuna to discuss the randomness of chance affecting human events. The tactician must remember as he plans that the enemy always gets a vote—and so does Fortuna.

A New Conception: Tactical Tenets

There are a few problems then with the principles of war that this work intends to correct. Through proliferation, expansion, and modification the principles of war drifted away from their original intent and conception. Classic theorists intended them as a list of tactical methods that would increase the probability of success in battle but not guarantee it. They were not intended to be applied at the strategic level, although the word "strategy" appears alongside them frequently before its modern definition calcified. Unmoored from their context, the principles were expanded in random directions.

To fix this, we reintroduce their nature in that they are subject to war's probability in chance and that they are tactical-level methods and not strategic. We reattach them to the planes on which we interact with our enemy: the physical, the mental, and the moral. When the principles are subject once again to their nature, we must examine how they connect to the overall strategy to which they are subject and contribute. This will hopefully provide a theoretical framework—or at least the beginnings of one—to assist both tacticians and strategists in thinking about, studying, and planning tactics. The physicist Stephen Hawking has described the field of physics as divided between two theories used for different examinations. The first is the general theory of relativity which applies to large objects; basically anything that can be seen with the naked eye. The second is quantum mechanics, which applies to "phenomena on extremely small scales, such as a millionth of a millionth of an inch."[25] Clausewitz and other major strategic theorists provide us with the equivalent of the general theory of relativity for war. There is, however, no equivalent of quantum mechanics that provides a theory of the granular level of war, or a theory to explain victory on the battlefield.

Conclusion

The rest of this book, then, is an attempt to provide that theory of quantum mechanics, a theory of warfare to complement war's general theory of relativity as explained best by Clausewitz. It is built on a restricted set of tactical principles focused on one object: victory on the battlefield. Those

tenets are organized by their use in physical, mental, and moral planes of conflict. Once we have explored how to achieve victory, we will explore the meaning of victory, and finally its use. This will lead us to tactical concepts that expand on the tactical tenets. Finally, we will explore the need to connect tactics to policy through the use of strategy. It is, in short, a humble attempt at a unified theory of tactics. The tactician is not a technician, but his tools have been misappropriated and misused by those who believe he is. This work is an attempt to retake them.

2

THE TACTICIAN'S TASK

> The process that is tactics includes the art of selecting from among your techniques those which create that unique approach for the enemy, time and place. Education is the basis for doing that—education not in what to do, but in how to think.
>
> —William Lind, *Maneuver Warfare Handbook*

Before discussing how a tactician should go about his task, we must first define the task. We must also define what it is not. Tactics is too often boiled down to an abbreviation: tactics, techniques, and procedures. This is an unfortunate grouping because tactics are a realm that is completely different from techniques and procedures. Both techniques and procedures are specific to individual military organizations and their specific gear and equipment. For example, it is a regulation in some militaries to fire warning shots in certain situations. U.S. Marine Corps units, however, will typically not fire until the situation calls for killing shots. This is a difference in technique. Procedures are also specific to organizations. The U.S. Army has no procedures for the use of amphibious assault vehicles because the Army does not have them in its inventory. The Marine Corps has many procedures for such vehicles because it does have them. A flanking maneuver, however, is a flanking maneuver regardless of whether a soldier or a Marine is employing it. It is a tactic: independent of specific organization and equipment and fundamentally different in nature from a technique or a

procedure. A technique is performance of a flanking maneuver via air assault (using helicopters to transport a maneuver unit that then attacks an enemy force from a flank). It is a more specific method by which the tactic can be accomplished, but not the only way. An example of a procedure is when a U.S. Marine Corps Battalion Commander uses the Air Tasking Order process to request CH-53 Super Stallion helicopters from the Air Combat Element to lift Alpha Company to the rear of an enemy so that the company can attack from the flank. This is a procedure because it is specific to the doctrine, organization, and equipment of the U.S. Marine Corps. This book covers only the first of these concepts: tactics.

At the most basic, the tactician is given a mission. U.S. military doctrine, for example, uses a set of tactical tasks as typical types of missions. These include enemy-oriented, terrain-oriented, and friendly oriented tasks.[1] Examples of enemy-oriented tasks include ambush, attack by fire, and block. Terrain-oriented tasks are those like seize or secure, and friendly oriented tasks focus on the support of friendly units, such as cover or screen. Such tasks vary from organization to organization.

What is important to our theory is that, whatever the mission, the tactician must confront an enemy that will attempt to prevent the accomplishment of that mission. To accomplish the mission, the tactician will have to defeat this opponent in some manner. Somewhere, the mission is connected to a larger strategy, but it arrives in the realm of tactics once the use of military forces is needed. The word “tactics” comes from the Greek word for “arrange” or “ordered.” Tactics is the arrangement of military forces in such a manner to defeat the enemy.

Defeat, however, is a nebulous term and its exact nature will depend on the situation at hand. To accomplish the task, the tactician might need to destroy or disperse the enemy entirely. Or he might only need to avoid them. In the case of a reconnaissance mission, he might only need to locate the enemy and report back on his disposition. He is defeated if the enemy eludes him. Even if the enemy force must be confronted, its total destruction is not always the goal. Clausewitz defined the destruction of an enemy as “they must be *put in such a condition that they can no longer carry on the fight*” (emphasis added). This does not mean that the enemy force must be totally destroyed. Indeed, he went on to say, “When we speak

of destroying the enemy's forces we must emphasize that nothing obliges us to limit this idea to physical forces: the moral element must also be considered."[2] In other words, breaking the moral cohesion of the opposing force is destruction of that force as an effective unit and the true goal of tactics.

Whatever the meaning of defeat is in the specific context of the mission to be accomplished, the tactician must be prepared to confront the enemy in combat of some manner. He evaluates the enemy's disposition or possible disposition and compares them with the means at his disposal, whether it is a fire team, a platoon, a fleet, or an army.

The essence of this combat comparison is the search for some advantage over the enemy. The advantage could take the form of a particular asset. To quote Sergeant Oddball in the 1970 movie *Kelly's Heroes:* "A Sherman [tank] can give you a very nice . . . edge."[3] In other cases, the tactician might need to outmaneuver, overwhelm, or move faster than the enemy. He might trick the enemy into reacting in a certain manner, thus opening the enemy up for an attack from a different direction. Or he might know that the morale of his troops is extremely high while the morale of the opponents' troops is low and presume that, during the clash of combat, the enemy will break and flee well before his own troops.

The comparison can be likened to a mathematical equation as long as we reckon with the paramount nature of probability. The equation can be weighted in favor of one side or the other, but 100 percent probability of victory is an impossibility. Still, the more advantages the tactician can accrue on his side of the equation, the greater the probability of victory. It tilts the battlefield toward him. There are three aspects of combat within which the tactician can seek to gain such an advantage: the physical plane, the mental plane, and the moral plane.

The physical realm of the battlefield is plainly the most obvious. Any field where forces clash is one of sensory overload. The din of sword and shield, the crack of arrow and bullet, and the screams of the wounded fill the ears. One is afraid to look at the frightful scenes and yet compelled to witness. Wounds and fatigue hurt, armor is heavy and hot. Even the taste buds detect the acrid gunpowder and carbon that hangs in the air.

It is also the simplest, to echo Clausewitz. The movements of arms and armies can be reduced to lines on a map. Staff officers sit in the flickering light inside a tent and move icons around on papyrus, sand, laminate, or on a computer screen. Tactics takes the form of geometric fractals that deceptively promise victory if repeated in proper patterns. Intelligence officers gauge troop strengths and predict positions, balancing the equation between friendly and enemy numbers. Logisticians check and recheck stacks of ammunition and multiply by consumption rates to plan the resupply of troops.

The physical realm is where all the science of war occurs. Those whose theories are more rooted in the science of combat—Bülow, Jomini, Liddell Hart—find their best expression here. They are not wrong: there is a technical aspect to tactics. As we will see, though, they just did not go far enough.

Although Jomini cannot be accused of reducing combat to solely scientific laws—he revised his views on politics and psychological elements late in his life after reading *On War*—he almost certainly reduced tactics to those laws.[4] Although he divided tactics into two parts, tactics and grand tactics, he strongly maintained that victory in battle depended on the commander's adherence to his principles. The core of Jomini's principles were, according to John Shy, "That all strategy is controlled by invariable scientific principles; and that these principles proscribe offensive action to mass forces against weaker enemy forces at some decisive point if strategy is to lead to victory."[5]

Despite his use of the word "strategy," this is a strictly tactical conception of victory. There is no consideration of the political objective underlying the hypothetical battle of the will and moral spirit on both sides. It is simply mass plus objective plus maneuver equals victory. Still, one aspect of Jomini's theory is key. Jomini believed that the principles of war applied across military history despite evolution in technology. This is a central component of this work as well: recall the example of the timelessness of the ambush.

This, then, is the essential paradox of tactics: some tactical tenets are timeless across military history but none will guarantee victory or work in every situation. At the Battle of Gaugamela in 331 BC, Alexander the Great

used his outnumbered but disciplined Macedonian and Greek phalanx troops to fix the forces of the Persian King Darius III in place, protecting his own flanks with his mobile cavalry forces. At a decisive point in the battle, Alexander personally led a charge intended to kill Darius. Darius fled and his subjects, willing to fight only because they had been commanded to do so, broke and fled. In AD 1520 the Spanish conquistador Hernán Cortés similarly faced a force of Mexican warriors that outnumbered his small band of Spanish and allied forces. Cortés had no military training to speak of, but he had read accounts of the Battle of Gaugamela. Cortés concentrated his better disciplined and armored Spanish infantry in his center and protected their flanks with his few cavalry forces (perhaps only twenty to forty horsemen). Waves of Mexican infantry, prodded on by an authoritarian ruler, broke against the Spanish front. Cortés himself replicated Alexander's feat and led a cavalry charge that killed the Mexican commander. Once the Mexican troops saw that the noble commander had been killed, their cohesion was shattered and they fled in disorder.[6]

The twin accounts of the Battle of Gaugamela and the Battle of Otumba offer proof of two things: that the study of military history and an understanding of tactics is useful for commanders, and that an underlying theory of tactics can be ascertained. But Cortés' quick thinking still might not have won the day: he himself could have been killed during his charge and the Spanish could have lost the will to continue the fight. While there are underlying principles of tactics, they are not immutable due to the inherent probability and chance of combat. Mastery of this central paradox of tactics is the difference between the student of tactics and the master.

Although Jomini did not go far enough, his conception of a mathematical, technical battlefield remains a good starting point as the most obvious plane on which tactics occur. On this sterile plane, there are four predominant ways to gain a physical advantage over the enemy: through maneuver, through mass, through firepower, and through tempo.

These four tactical tenets are physical means of achieving advantage. Maneuver is a method where one force attacks another at the point where it is weaker, such as a flank, supply line, or other uncovered point. It is essentially a positional advantage. Mass is a method where some physical superiority—usually numerical—over the enemy is arranged. Thus it is an

advantage in size or power. Firepower is simply outshooting your enemy: whether it is the arrows of Xerxes' Persians or the shock and awe aerial campaign of Operation Iraqi Freedom. It is an advantage in volume combined with accuracy. Finally, tempo is simply the ability to move faster than your enemy can react or the ability to last longer in the fight than your enemy can—a temporal advantage.

Most importantly, though, these tactical tenets are not mutually exclusive. Maneuvering against an enemy flank depends on the maneuver element's ability to move faster than the enemy can react with enough mass and firepower to exploit the maneuver once it has occurred. Additionally, gaining any type of advantage over the enemy simply raises the probability of success.

Still more advantage can be gained by playing on the mind of the enemy tactician. The most common methods are deception to prevent the enemy from accurately assessing the equation, surprise to limit the time he has to make that assessment, sowing confusion to corrupt his decision-making process, or taking some bold action that shocks him to the point where he is unable to even make a decision, except the decision to flee.

Finally, the battlefield equation in the tactician's mind must take into account the moral aspects of the battle. The morale of the troops engaged, the cohesion of the military units involved, and their spirit and enthusiasm for the task at hand are all aspects of the moral plane that matter a great deal in combat. Many a tactician has forgotten the moral power of his enemy, and plans that otherwise might have succeeded have fallen apart in the face of an enemy that just will not give in no matter that the odds are against them.

Victory in the narrow scope of this work, then, is the accomplishment of a mission by gaining an advantage over the enemy that prevents him from accomplishing his mission. This is usually achieved when the enemy force has lost its moral cohesion and fled, refused to fight, or otherwise lost its ability to function as a single unit.

While the problems with the principles of battle have already been discussed, they can still be used as a guide. By compiling as many lists as possible and scoring each principle of war based on how many lists it appeared on, I distilled a list of principles that must be addressed. Principles that were essentially identical I combined. Others fell off the list because

they appeared only once. Others—such as speed—I renamed to flesh out the concept. Still others I found useful, but not for tactics. Some of these appear in the appendix on the principles of planning. I then organized the remainder based on the three planes put forth by J. F. C. Fuller. The result is nine tactical tenets, named so because principles are implied to be immutable, but tenets are not.

Four Physical Tenets

- Maneuver
- Mass
- Firepower
- Tempo

Four Mental Tenets

- Deception
- Surprise
- Confusion
- Shock

One Moral Tenet

- Moral Cohesion

The intent of this tactical system is that the tactician arranges the physical means at his disposal in terms of maneuver, mass, firepower, and tempo to inflict mental effects in the mind of the opposing tactician and his units: deception, surprise, confusion, and shock. The accumulation of these mental effects will at some point overwhelm the enemy unit, at which point they will lose moral cohesion. Every military unit has its breaking point, even if it is propped up by a variety of factors. Once that moral cohesion is broken—usually only temporarily—the broken unit cannot prevent the victorious one from achieving its mission.

Each of these three planes will be examined in turn: first the four physical methods of achieving advantage will establish a fundamental base to the theory. Next, the mental effects that various combinations of these four tenets will be examined. Finally, the one moral tenet—moral cohesion

—will be discussed. Once we have a theory of how to achieve advantage and thus victory, we will derive concepts from the use of these principles and then reconnect this tactical theory with its contextual environment—strategy.

PART I

TACTICAL TENETS

> It is absolutely true in war, were other things equal, that numbers, whether men, shells, bombs, etc., would be supreme. Yet it is also absolutely true that other things are never equal and can never be equal.
>
> —J. F. C. Fuller

The tactician wants only one thing from a theory of tactics: a guide to victory. This was the original intent of the principles of war, but since they lack standardization and discipline the tactician is left with a confusing mess of skeletal theory.

The traditional principles of war also do not address the three planes on which tactics occur: the physical, the mental, and the moral.

This work presents nine tactical tenets arranged by those three planes. The four physical tenets are maneuver, mass, firepower, and tempo. The four mental tenets are deception, surprise, confusion, and shock. The moral plane stands alone as it is too intangible to be reduced to strict codification, but the moral power of opposed combatants is a weapon that cannot be ignored.

The four physical tenets are the ways that a tactician can arrange his forces on the battlefield. Effective use of each raises the probability of victory in the tactician's favor. An ambush is an ideal example. The tactician masses his forces and his available firepower against the expected

flank of an enemy force, which is maneuver. He also controls the tempo of the contest by reducing the enemy's ability to react.

The true power of the ambush, however, lies not in these physical deployments but rather in the mental effects produced in the minds of its victims. The deceptive nature of a successful ambush causes surprise, shock, and confusion once it is revealed. Even the most battle-hardened and well-trained forces are not immune to the mental effects.

Last, the combined mental effects caused by physical deployments harm the moral cohesion of a military unit. Every military unit is bound together into a whole by various factors: duty, patriotism, training, shared experience and privation, and the morale of its members, to name just a few. Moral cohesion keeps the unit in the fight and striving toward its mission. Once the well of a unit's cohesion is depleted or overcome, it ceases to function as a unit. The goal of a tactician, victory, is to shatter or deplete the opponent's moral cohesion while simultaneously preserving the moral cohesion of friendly units.

3

MANEUVER

We're going to hold him by his balls and kick him in the ass.

—Gen. George Patton

As the Union soldiers of XI Corps gathered around campfires to prepare their dinner, they observed a number of woodland animals fleeing the woods that lay on the right flank of their line. Immediately following the woodland vanguard came two Confederate divisions under Gen. Stonewall Jackson, followed by elements of another division under Gen. A. P. Hill. Roughly 30,000 screaming Confederates crashed into the completely unprepared Union line.[1] The assault was initially contested only by overturned cooking pots and stacked Union rifles, but the Confederate soldiers navigated over these paltry obstacles and routed the first Union division in line. The next division turned and faced the attack, but was enveloped on both flanks by the Confederate line and collapsed as well.

By the time the Confederate attack became too disorganized and the rebels too exhausted to continue, they had advanced about two miles and collapsed the Union line in on itself around Chancellorsville, Virginia, with its back to the Rapidan River.

It was 2 May 1863 and the Confederate tide had not yet been turned. Gen. Robert E. Lee had again done what seemed impossible: he had defeated, but not broken, a much larger Union force. On 3 May Maj. Gen. John Sedgewick, commanding the Union forces occupying Fredericksburg

to the east of Chancellorsville, broke through the Confederate lines of Jubal Early in an attempt to unite his forces with those at Chancellorsville under Gen. Joe Hooker's forces now recovering from Jackson's sweeping maneuver. Jackson himself lay mortally wounded after being shot accidentally by his own men on the night of 2 May. By 4 May Sedgewick's progress was stymied by Early and all Union forces began a withdrawal north of the river.

According to the principle of mass, the Battle of the Wilderness should have been a Union victory. The Union forces under Hooker numbered over 130,000, more than twice that of Lee's 60,000. Lee used a paltry 15,000 troops as a fixing force to keep the Union Army in place while Stonewall Jackson marched his corps around the flank. Although Hooker's forces were split between Chancellorsville and Fredericksburg, he had numerical superiority at both places and forced Lee to split his forces as well. In fact, the battle was the result of a maneuver on Hooker's part. The Army of Virginia was entrenched on the southern shore of the Rapidan. Rather than attack Lee's fortifications directly, as Burnside had foolishly done at Fredericksburg the winter before, Hooker crossed the river far west of the Confederate position and then approached the fortifications from the rear, rendering them useless. Lee's flanking attack was a counter-maneuver that Hooker, confident that it was he that had outmaneuvered Lee, was unprepared for.[2]

The Battle of Chancellorsville, then, is a case study in the failure to capitalize on mass and the potential of maneuver, of which Lee was a master. It was not the first example, nor the last, of Lee's mastery.

Maneuver can be defined as attacking an enemy force from a position of comparative advantage. Attacking an enemy unit's flank, as Jackson did at Chancellorsville, offered an advantage since the Union troops were more prepared for an attack from their front than to their flanks. Maneuver has also been an important component of naval combat from the dawn of naval combat. During the Persian Wars, the Persian fleets tended to form tight battle lines as if the fleet were a phalanx. This presented the bronze-armored ramming prows forward. At some point though, Greek sailors developed the *diekplous* maneuver. The sailors would row their triremes through gaps in the Persian line and then turn around to ram the unarmored

rear and flanks of the Persian vessels. During the age of sail, attacking an enemy fleet from upwind of that fleet was advantageous because you could then use that wind to either force battle or avoid it while the enemy fleet could not. An admiral with this maneuver advantage was said to "hold the weather gauge."

When it comes to aerial warfare, aircraft are inherently a method of maneuver because they use the air as a medium in which only other aircraft can transit; they have a positional advantage against any unit except other aircraft. A squadron of A-10 Warthogs deployed against an enemy tank battalion, for example, has such an advantage in both maneuver and firepower that the outcome is certain. For navies, the use of undersea vessels is also a form of maneuver. In this context, maneuver is any kind of asymmetry, whether it is spatial, functional, or otherwise. Choosing tactics that your opponent is not adept at countering is simply a way of tactically outmaneuvering him.

Maneuver, however, is not a strictly modern concept. The evolution of tactics during the age of Hellenistic warfare is instructive. War between the Greek city-states was, for a time, characterized by phalanx versus phalanx warfare. The phalanx formation was composed of the land-owning citizenry of the *demos,* except for Sparta which utilized a professional army. When disagreements break out between two cities, "these Greeks are accustomed to wage their wars among each other in the most senseless way. . . . For as soon as they declare war on each other, they seek out the fairest and most level ground, and then go down there to do battle on it. Consequently, even the winners leave with extreme losses; I need not mention the conquered, since they are annihilated."[3] The Greeks simply marched straight at each other, at least initially.

The Greek hoplites formed tightly packed square formations of infantry and wielded long spears and shields.[4] The shields and spears would overlap, creating a porcupine-like effect. But, in one direction only: forward. The flanks and rear of the phalanx were completely unprotected and the hoplites were packed so tightly together that they could not turn easily to defend themselves. The phalanx partly depended on the cultural mores that encouraged Greeks to fight phalanx to phalanx to be effective. Some Greeks despised stratagems and missile weapons that did not expose

the thrower or shooter to retaliation.[5] When this culturally imposed limitation broke down, the phalanx became less effective.

The phalanx was so powerful to its front that it was inevitable that someone would adopt tactics to avoid its spears. Xerxes, for example, had to go around the Spartan phalanx at Thermopylae during the Persian Wars. Later, during the Peloponnesian Wars, the Athenian general Thucydides defeated the Spartans on the island of Sphacteria by adopting hit-and-run tactics with lightly armed archers and *peltasts* (lightly armored troops carrying javelins) to wear down another Spartan contingent in 425 BC, forcing it to surrender.

In the earliest days of military history, then, we can see the phalanx as the ultimate expression of mass and maneuver tactics developing to counteract it. The phalanx, however, was only effective against enemy forces that chose to attack it head on. As mentioned above, Greek militaries began to use *peltasts* and even some cavalry units in addition to the phalanx. The phalanx was still the base of Greek warfare, and other troops were never tightly integrated until the reign of Philip II in Macedon. Philip built a military force composed of an improved phalanx (the Foot Companions), light ground troops (the Shield Bearers), and heavy, well-trained cavalry (the Companion Cavalry).[6] The use of the Companion Cavalry to strike an enemy's phalanx from the flank was the key to Philip's fighting style, but the other two arms remained important. This army, as well as Philip's investment in siege technology that the Greeks rarely used, allowed him to dominate Greek warfare during his reign (359–336 BC) and seize control of Greece itself. This proto-combined arms force, predicated on the concept of maneuver, was the army that Philip's son Alexander the Great would use to conquer the known world.

Maneuver dominated medieval warfare as armies were built around cavalry whose utility had increased since the development of the stirrup. In the West the heavily armored knight on horseback was the apex of chivalric warrior virtue; tactics revolved around them. Knights were usually organized into three groups, called "battles," which would simply charge the opponent.[7] Little more thought was put into tactics because the mobility and momentum of the charging horse stood in for critical thought. In the East warfare was dominated not by heavy cavalry, but by horse archers. The

Mongols developed great skill in firing a bow from horseback; it was masses of extremely maneuverable horse archers that made their armies so potent. In contrast to Western chivalry, the Mongols put thought into their tactics and thus won significant victories over Western forces at battles such as the Battle of the Kalka River (AD 1222), the Battle of Liegnitz (AD 1241), and the Battle of Mohi Bridge (AD 1241).

Maneuver truly came into its own during the Napoleonic wars and Jomini was Napoleon's scribe. A good example of maneuver during this time is one of Napoleon's favorite tactics, *manoevre de derrière* (maneuver onto the rear). Napoleon would use the highly mobile French troops, trained for and used to hard marching, to circle around an approaching enemy army and seize a point on their supply lines, even though this exposed the rear of Napoleon's army to unfriendly territory. The enemy army, expecting battle to their front, would suddenly have to turn around and redeploy their forces back the way they had come to fight at a place preselected by Napoleon. The disorientation and confusion caused by this type of maneuver caused whole armies to surrender, such as the Austrian army under General Karl Mack von Leiberich at Ulm in 1805. Mack was so bewildered by the speed of the maneuver that he seemed frozen, "as if hypnotized."[8] The tactical ideas of Jomini, who was present at Ulm as a staff officer, were greatly influenced by Napoleon's style of maneuver.

Another key to Napoleon's success was his command of interior versus exterior lines. A favorite tactic of his was to place his own army between two enemy armies, essentially making himself outnumbered and surrounded. Once his two enemy armies were cut off from each other, he would attack one, defeat it, then attack the other and defeat it, using the superior speed of the French army along shorter interior lines to ensure he had local superiority over first one enemy army, then the other.

Maneuvers such as Lee's at Chancellorsville still had use after the Civil War although the massed, direct attack still remained the basic tactical maneuver. Although frontal attacks showed signs of decreased utility as early as the famous Charge of the Light Brigade in 1854, or even as early as the Battle of Bunker Hill in 1775, it was still the preferred method to attack. Lee himself famously tried a direct attack on the third day of Gettysburg and failed. The massed attack remained popular in the Franco-Prussian War,

the Boer War, and the Russo-Japanese War, despite the appalling number of casualties made possible by modern firearms.

The stalemate on the western front during World War I, perhaps the ultimate expression of mass, caused the next major evolution in maneuver tactics. The immense firepower employed by the vast European armies enabled both sides to fortify a line from one end of the continent to the other, completely disabling the ability of both sides to maneuver around flanks. In response to the deadlock, various militaries developed infiltration tactics, although the German army took them the furthest. Rather than outflanking or enveloping enemy positions, infiltration tactics attempted to break through defensive lines at weak points, then bypass stronger areas to attack (presumably) weaker positions in the enemy's rear. Such attacks were executed by infantry trained to work quickly and independently who were provided with a variety of weapons with different strengths and weaknesses (like light artillery, machine guns, and flamethrowers). These infiltration tactics arose in response to the deadlock on the Western front but also as a result of German fascination with the tactics of the Boers in South Africa. The German army experimented with such tactics on a small scale—even providing a battalion-sized model of an assault regiment under the command of a captain for experimentation in actual combat—then gradually expanded their use.[9] Still, these new tactics could not break the deadlock because they led to defensive tactical innovations like the defense in depth. They were, however, largely in use by every major military in some capacity by World War II.

The Germans would essentially use infiltration tactics on a much larger scale in World War II. By combining modern tanks and motorized infantry, Nazi Germany achieved astounding victories over Allied troops early in the war. The tactical development achieved by the Wehrmacht far outstripped the Allies. For example, on the Eastern Front the German army managed to regularly encircle and destroy hundreds of thousands of Red Army soldiers with rapid maneuver. On one occasion, four Soviet armies—numbering 417,000 men—were encircled. On another occasion two panzer corps encircled a force of 700,000 enemy soldiers, an amazing number.[10] The idea of German tactical prowess in the form of blitzkrieg has been criticized because the tactics failed to defeat the Red Army on the eastern front. While

it is true the Soviets were not defeated, they absorbed perhaps the highest human costs in military history in the process. The tactics worked—the numbers prove that—but the strategy was inept.

The concept of maneuver is essentially the core of British military theorist Sir Basil Liddell Hart's conception of strategy. In his book, *Strategy,* Liddell Hart believes that by taking an indirect approach one can displace or dislocate the opponent, forcing him to rebalance versus focusing effort on unbalancing the other side.[11] Liddell Hart constructed a theory of strategy on this basis but the result was less than useful. In tactical terms, however, an indirect approach is usually preferable. Direct approaches, whether they take the form of charging massed spears or massed machine guns, are unlikely to succeed; if they do succeed, though, they will be costly.

The Germans expanded their infiltration tactics onto a theater-wide level with a combination of an envelopment (bypassing the Maginot Line) and mass directed along multiple offensive thrusts. Along with these tactics was a healthy dose of surprise and deception, to be discussed later. General Heinz Guderian's 1st Panzer Division arrived at Sedan on 12 May 1939.[12] Another major thrust was being led by General Erwin Rommel, commander of the 7th Panzer Division. It's important to note that although piercing through an enemy defensive line at select points is a form of maneuver, it is usually facilitated by mass. The German panzer units were concentrated firepower in and of themselves and were then reinforced with dedicated artillery and close air support aircraft.[13] An indirect punch could hit a weak spot, but it still needs to be a powerful punch.

The 2003 Iraq War provides examples of modern maneuver tactics on both a large and a small scale. The initial land campaign included a British amphibious operation to seize key terrain, a northerly advance by the 1st Marine Expeditionary Force to fix the main Iraqi forces, and a wide envelopment (discussed below) aimed at Baghdad by the U.S. Army 5th Corps.[14] This is a large-scale example, involving distances of hundreds of miles, but tactical maneuver applies down to the smallest levels. Within the 1st Marine Expeditionary Force, Regimental Combat Teams 5 and 7, along with the U.S. Army's Third Infantry Division, moved far to the west of the

main Iraqi defenses while Regimental Combat Team-1 attacked them directly.[15] At the lowest level, in the Second Battle of Fallujah, insurgents in the city spent months developing defensive systems such as trenches and improvised explosives to defend the city at points that Marines had approached previously, in the south and the northeast.[16] This is an example of using the previous maneuvers of your enemy to predict their future actions. The Marines at Fallujah would have to outmaneuver many such fortifications.

Forms of Maneuver

Military doctrine usually codifies different forms of maneuver along the lines listed below:[17]

Frontal Attack

Although this chapter focuses on the use of maneuver to avoid a frontal attack, it is one form of maneuver and has its uses, notably to fix or tie down an enemy while another force attacks from a different direction. It is quite simply an attack directed at the enemy's front.

Flanking Attack

A flanking attack is one that is directed against any portion of the enemy that is not the front, such as the flank or the rear. It creates an advantage for the attacker because the defenders' weapons and defenses are usually not ready for an attack from the given direction.

Envelopment

An envelopment is a form of maneuver where the attacking force bypasses the defender toward an objective in the rear of the defense. This will typically cause the defender to abandon his defense because the attacker is now in a different and unexpected location. This is what General Hooker intended to accomplish by crossing the Rapidan far to Lee's west. A single

envelopment involves one attacking force bypassing the enemy on one flank, while a double envelopment involves two attacking forces bypassing on both flanks simultaneously. When a fixing force is involved in a simultaneous frontal attack, the two forces are close enough to mutually support each other.

Turning Movement

A turning movement is similar to an envelopment but is characterized by the attacking force bypassing the defending force and then obtaining an objective that is far deeper in the enemy's rear area than during an envelopment. When a fixing force is involved in a turning movement the flanking force is usually too far away for mutual support.

Infiltration

Infiltration maneuver as defined here involves the use and/or creation of weak or undefended points in the enemy's defensive array that the attacking force uses to advance, thus avoiding strong points and exploiting weak points. This produces disconnects between various enemy units, preventing them from supporting each other while exposing flank and rear areas to flanking attacks. (In the process, however, the flanks of the infiltration forces are typically exposed as well.)

These various forms of maneuver can be used in combination to produce tactical advantage through spatial positioning of the attacking force vis-à-vis the defending force. When combined with geographic advantages —for example, a Confederate Army corps moving through dense woods to conceal its flanking attack—maneuver is one of the tactician's most powerful weapons.

Swarming Maneuver

Swarm maneuvers or swarming tactics have received a lot of attention in recent years, especially since the infamous Millennium Challenge 2002 war-game where Lt. Gen. Paul Van Riper (U.S. Marine Corps, retired) used waves of small boats to defeat a U.S. naval task force in a simulated battle

in the Persian Gulf.[18] A swarm maneuver is one that lacks both a form of maneuver and mass: numerous small or individual units attack from multiple and seemingly random directions, like a swarm of bees. Such tactics are applicable on land as well. The Somali National Army uses mounted squads (typically on pickup trucks with a crew-served weapon also known as a technical) that move independently, keeping within sight of each other, depending on the terrain. By moving in this widely dispersed fashion, such units ensure that when they locate an enemy, at least some friendly units will be in position to flank that enemy unit.[19] Although such swarm tactics are usually presented as new, they work on the same logic as Napoleon's corps system. Napoleon used army corps that were strong enough to fight independently but he moved them to battle separately. Once his enemy had formed for battle, Napoleon would concentrate the dispersed corps to fight, usually with one or more designated to attack an enemy's flank. The guerrilla fighter Ernesto "Che" Guevara described the minuet, wherein small guerrilla bands would surround a column of regulars at various points.[20] One band would attack the column, the column would pursue, and the band would retreat while one of the other guerilla detachments initiated an attack on the regulars from another point, starting the process over again until the column of regulars was defeated. As far back as 1866 light troops used swarming tactics, even with bayonets, such as in this description of a Prussian attack during the Austrian-Prussian War in that year: "Like wasps, when their nest is disturbed by some blunderer, they swarmed all around their dazed enemy, and put him to flight by the countless attacks of small groups converging at the right time and place. They received no orders to do so any more than the Austrians, but, from Subaltern to General a thorough military education had developed in them the reflexes necessary for the proper exercise of command in war."[21]

There is a lot of discussion about swarming tactics and their importance and viability or lack thereof. These tactics are, however, simply another form of maneuver in addition to those listed above. A swarming attack, whether by boat or by numerous fire teams coming from many different directions, is a combination of simultaneous flanking and frontal attacks massed on a single target conducted by forces that are not massed.

Last, it is important to remember that maneuver is not always possible. A well-chosen defensive position can limit the attackers' options, especially when it comes to spatial maneuver. One example of such a situation is the British attack at Goose Green during the Falklands War in 1982. The Second Battalion, Parachute Regiment, attacked a fortified Argentine defense line on a narrow peninsula that could not be outflanked. The British troopers succeeded in capturing the position with a frontal assault, but the attack was less than ideal.[22]

The principle of maneuver, then, is remarkably similar to Jomini's conception of strategy. It is the application of force against a point where you have an advantage over the enemy, whether that point is a line of communication, a flank, a weak point in the enemy's line or scheme, or any other point that will produce an effect or force a decision on the enemy. It depends on three other tactical tenets though: a higher tempo used to gain local superiority (mass) at that decisive point, with sufficient firepower, at the appropriate time together are the key to tactical success. The German army in the 1930s and 1940s probably achieved the highest level of this system seen thus far. Although the term "blitzkrieg" was not used by the Germans, it is an expression of what they had achieved. By combining modern technology with tactical prowess, the Germans had seemingly created an entirely new way of warfare. In reality, it was simply a skillful application of mass and firepower applied to decisive points followed by maneuver against weaker enemy positions at a high enough tempo so that enemy leaders could not react in time. It was Jomini's methods plus Liddell Hart's indirect approach, plus John Boyd's focus on acting faster than the opponent. We can see a conclusion forming already: combinations of tactical tenets in ways appropriate to the situation produce tactical success greater than the sum of their parts. First, though, we must examine other tactical tenets in turn.

4

MASS

Quantity has a quality all its own.

—Attributed to Joseph Stalin

On 22 November 1942 the jaws of the Soviet trap snapped shut. The two wings of Operation Uranus, the Red Army's successful encirclement of the German Sixth Army in and around Stalingrad, met in the town of Kalach.[1] About 265,000 Axis troops under the command of the general of panzer troops, Friedrich Paulus, were surrounded by five Soviet armies who immediately made preparations to defend against breakout attempts from within and German relief efforts from without. Rather than give up the city, Adolf Hitler ordered that the beleaguered Germans be supplied by air. A German offensive to pierce the Soviet cordon, led by the legendary General Manstein, almost succeeded, but in the end the German Sixth Army slowly suffocated.

Deprived of the ability to maneuver, the Sixth Army could only attempt to hold out against the massive number of Soviet troops. Soviet offensives steadily shrank the German pocket. Airfields inside were eventually retaken by Red Army troops, cutting off all supplies to the German forces. Food was so short that Germans fought each other over bread. Fuel ran out, rendering vehicles useless. By March 1943 the last of the German forces surrendered and the Sixth Army disappeared.

The Soviets had obviated the German tactical system, based on maneuver, through sheer numbers. Most Russian attacks were tactically incompetent: at one point they persisted in a direct attack against a German panzer division for two days as the Germans calmly destroyed dozens of Russian tanks.[2] Although the Soviets had used a maneuver to facilitate the encirclement—the two wings of the pincer were directed at points in the German line thinly held by their Romanian allies—it was the sheer mass of the Soviet offensive that defeated the Germans. Operation Uranus was supported by Operation Mars, an attack designed to prevent the German Ninth Army from sending reinforcements south to support the Sixth Army by encircling and destroying it.[3] Indeed, the massive number of soldiers the Soviet Union was able to put in the field, supported by supplies provided through Lend-Lease from the United States, had allowed the Red Army to steadily erase German gains since their invasion, Operation Barbarossa, stalled just short of Moscow. Stalin committed around a million men to the attempted double envelopment. The Soviet Union even organized horse cavalry units and sent them into battle alongside T-34 tanks.

Mass is an advantageous concentration of combat power in space and/or time. It is the first principle on many lists and it is by far the most common. Clausewitz, accused by Liddell Hart of being the Mahdi of Mass, devoted an entire chapter to mass: "Superiority of Numbers" is short but emphatic. He states that numerical superiority is "the most common element in victory."[4] But Clausewitz also qualified this statement. Overwhelming mass could be achieved but other variables—he uses the quality of troops as one example—play on the problem as well. In his view, what really matters is superiority at a vital or decisive point. In another qualification, he states that "it would be seriously misunderstanding our argument, to consider numerical superiority as indispensable to victory."[5] Combat power where it counts—the decisive point—matters to the outcome of the battle.

When it comes to mass, the trick is to concentrate when it is advantageous to do so but stay dispersed when it is not. Dispersal of large numbers of friendly forces makes it harder for the enemy to target a group of them, makes it difficult for the enemy to keep track of them, and can even prevent the enemy from knowing how many assets you have on the

battlefield. Conversely, a concentration of forces is easier to find and target and more troops are more difficult to keep supplied with food, water, and ammunition. Additionally, dispersing combat forces can facilitate maneuver tactics, such as swarming or infiltration. A recent U.S. Navy concept, distributed lethality, is built on the interplay between concentration and dispersal. For decades the Navy has preferred to concentrate combat power in fleets composed of multiple vessels. The distributed lethality concept, however, calls for smaller, quicker, but more numerous vessels, as well as increasing the armament of all existing vessels. More U.S. Navy ships spread over a wider area poses a greater dilemma to potential enemies, protects U.S. Navy assets against enemy firepower, and offers naval commanders greater flexibility when it comes to options for maneuver.

Another Clausewitzian concept—the concept of the center of gravity—frequently gets mixed up with the concept of mass. Not without reason; the two terms are closely related in physics. American military doctrine seized on this connection and uses the term *center of gravity* to mean a concentration of friendly or enemy combat power that has the potential to be tactically decisive. Clausewitz's idea, however, is more applicable to strategy and is not necessarily military or even physical. Those who blame Clausewitz for the horrors of World War I should instead blame those who have bastardized his concepts.

Clausewitz was right, though, to highlight the importance of mass. It is self-evident that more potential combat power is better than less. Used intelligently, mass can overcome other tactical tenets by smothering the enemy force, as shown by the Red Army during World War II. It is not a guarantor of success, though. At the famous Battle of Cannae on 2 August 216 BC during the Second Punic War, the Romans expected to steamroll the Carthaginian general Hannibal's army with their two-to-one advantage in heavy, trained infantry. Hannibal used a feigned retreat of the troops in his center to draw the Roman columns into a double envelopment. Once hemmed in by Hannibal, the mass of the Romans was useless and it is reported that the Roman soldiers were packed so tightly together that they could not raise their sword arms; many died standing in formation. As many as 75,000 Romans died, an astronomical figure in ancient warfare.

Another example of a force that had the advantage of mass but could not capitalize on it is the British column of 16,000 (although only 4,500

were soldiers) that left Kabul, Afghanistan, in 1847 in an attempt to reach British India. It had the advantage of discipline and mass over the small groups of Afghan tribesmen that harried it with swarming tactics. Only one British soldier, who was wounded four times, survived.[6] A lack of mass, however, stymied American Special Forces in Afghanistan in 2001. At the Battle of Tora Bora where the aim was for special operators from the United States' Joint Special Operations Command (JSOC) to capture al Qaeda's top leadership including Osama bin Laden, JSOC repeatedly asked for reinforcing troops to cut off likely avenues of escape from the mountains of Tora Bora into Pakistan. Even though both U.S. Army and U.S. Marine Corps troops were in the region, higher headquarters repeatedly denied their requests.[7] The operators of JSOC, the most highly trained and skilled soldiers and sailors in the world, could not be everywhere at once or overwhelm the al Qaeda rear guard with the limited numbers at their disposal. As a result, their quarry escaped into Pakistan. JSOC would not get a second chance at Osama bin Laden for another ten years.

Much like the Russians would be in the next century, Gen. Ulysses S. Grant was forced to deal with a master maneuverist in Robert E. Lee and would have to do so through the intelligent use of the mass of the Union armies. Indeed, Lee had already savaged four other Union generals into early retirement or demotion. Grant realized, however, that the North could generate more mass than the wily Confederate general could possibly deal with. This was the strategic conception behind the Union offensives of 1864, including Sherman's march to the sea and Grant's own campaign in northern Virginia.

In his memoirs, Grant states, "My general plan was to concentrate all the force possible against the Confederate armies in the field." "Accordingly I arranged for a simultaneous movement all along the line."[8] Four Union armies would attack at once from four different directions, forcing the Army of Virginia under Lee and the other large Confederate Army under Gen. Joseph E. Johnston to go on the defensive and sacrifice terrain. Johnston attempted to prevent Sherman's march to Atlanta but was repeatedly outmaneuvered. Lee, defending Richmond, would face Grant himself who was personally overseeing the Army of the Potomac, nominally commanded by General Meade.

Grant had proved himself a masterful maneuverist himself during the Vicksburg campaign, but he had yet to face Lee. After putting in place the aforementioned plans, Grant and Meade began the campaign against Lee in May 1864. The Army of the Potomac outnumbered Lee's Army of Virginia by almost two to one. From May to June Grant repeatedly moved his army between Lee and Richmond, forcing Lee to fight. Lee did so at the Battle of the Wilderness, the Battle of North Anna, and Cold Harbor. Unlike Lee's previous opponents, however, Grant showed indomitable tenacity and followed up even tactical defeats with more offensives. These battles were largely inconclusive in and of themselves, but by refusing to allow Lee time to recover, Grant kept the pressure and Confederate casualties mounting. To be sure, Union casualties increased as well, and Grant continues to be criticized for the high rate of attrition, but the Union at this point could absorb the repeated blows. The Confederacy could not. Grant had to use his advantage in mass to defeat Lee's expertise in maneuver. And it worked. Lee's numbers dwindled so much that he submitted to a siege at Petersburg in a last-ditch attempt to defend Richmond.

Although it was not a true siege, it played to the Union's strengths. Lee had outmaneuvered the Union and gave battle where and when he chose since gaining command of Confederate forces in June 1862. Now, with Richmond again threatened, Lee's ability to outmaneuver lackadaisical Union commanders was gone. Lee began the siege with around 55,000 men, but casualties, desertions, and disease whittled that number down constantly. By comparison, Grant had around 120,000 men under his command—with more recruits arriving all the time and Sherman's army burning its way north through South Carolina to join in.[9]

Grant was anything but lackadaisical. For nine months Grant used his advantage in mass to batter the Confederate lines around Virginia in brutal direct assaults from trench to trench. Simultaneously, Grant repeatedly tried to outflank Lee. It was the mass that Grant had available that allowed him to pin down Confederate forces and attempt to outflank them, and to detach forces to attack their sources of supply. Mass gave Grant options and he used them to constrict Lee's own option. The fortifications and dedication of the Confederate soldiers allowed them to stave off the Union assaults and inflict massive casualties. Far more Union soldiers perished in the

campaign. Grant finally broke through on 2 April 1865. After Philip Sheridan's cavalry—fighting on foot—routed two Confederate divisions under George Pickett, Grant ordered a full-scale attack at every point.[10] Lee ordered a retreat.

Lee made a final attempt to save his army by heading west, hoping to unite with other Confederate forces, but his army was starved, diseased, and had dwindled to about 35,000 men.[11] Grant now had roughly 150,000 troops closing in, and he threw them after Lee. The Union troops gave Lee no rest and harried the Confederates in a series of battles from 2 April to 9 April. At 3:00 p.m., hemmed in on three sides, Lee surrendered.

What these two cases show is the ability to use mass to constrict the enemy's options and initiative and overwhelm them with pure numbers. Mass also enables more forms of maneuver such as the double envelopment used by the Soviets or the eventual triple envelopment of Lee around Appomattox. Not for nothing, then, did Clausewitz place such emphasis on numerical superiority. Size matters, but how you use it matters more.

A pair of Jominian concepts can also help us understand the use of mass: interior and exterior lines. Jomini defined interior lines as "those adopted by one or two armies to oppose several hostile bodies, and having such a direction that the general can concentrate the masses and maneuver his whole force in a shorter period of time than it would require for the enemy to oppose to them a greater force." If a commander has all of his forces concentrated in one area, he can attack from any point outward faster than his enemy can. The opposing force is obliged to operate on exterior lines, which he defined as "those formed by an army which operates at the same time on both flanks of the enemy, or against several of his masses."[12] The commander operating on exterior lines can attack at any practicable point, but must move his units around the concentration of the opponent. This concept basically describes the ability of one opponent to shift mass in relation to the enemy. If you have a strong perimeter and the enemy is operating outside of it, the enemy is operating on exterior lines while you are operating on interior lines. The advantage to interior lines is that you can shift forces from one part of the defense to another quickly and without much risk of interference on the part of the enemy. The enemy operating on exterior lines cannot shift forces from one angle to another because the

force on the interior would interfere, so units must go around the perimeter. This makes troop movements less efficient. Which form is superior depends greatly on terrain and the numerical disparity of the opponents as the ability to operate on interior or exterior lines enables more—or less—forms of maneuver. You must have enough mass to maintain the interior perimeter and still shift forces from one sector to another, for example. Operating on exterior lines has advantages, too, if you have sufficient mass to attack the interior force from numerous angles. A good example is the Civil War: The Confederacy could shift troops from one sector to another unopposed because of its geography and used this ability to great effect. Once the Union generated enough mass, however, Grant was able to launch multiple simultaneous offensives that the Confederacy did not have enough mass to oppose. The interior lines of the Confederacy were initially an advantage, but became a disadvantage later in the war.

Numerical superiority, however, is no guarantee of success and these concepts apply equally to naval warfare. A central part of American naval theorist Adm. Alfred Thayer Mahan's theory is the use of interior and exterior lines by naval forces. Of course, maneuver applies as well. In both the Battle of the Nile (1798) and the Battle of Trafalgar (1805), Admiral Horatio Nelson of the British Royal Navy defeated French naval forces that outnumbered his own; by using maneuver and surprise to attack portions of the enemy with his entire force, thus achieving local superiority.[13] There are numerous examples of outnumbered—sometimes vastly outnumbered—military forces achieving victory. The reputation of Frederick the Great was largely built on his uncanny ability to defeat larger forces. At the Battle of Hohenfriedberg on 4 June 1745, Frederick used surprise and an aggressive flanking cavalry attack to defeat a numerically superior Austrian army. At Leuthen in 1757, Frederick used a combination of mass and maneuver known as the "oblique order": an emulation of the tactics of Epaminondas of Thebes at the Battle of Leuctra in 371 BC.[14] (See chapter 14.) Frederick concentrated mass at one end of his line instead of dispersing it evenly across his entire formation. This asymmetry in mass allowed him greater flexibility in that area, which he used to outflank and route the Austrians. Examples such as these show that the employment of forces can overcome mass, especially through adroit maneuver. These two tactical tenets interact

in meaningful ways. A clever combination of the two is demonstrated by a battle formation developed by the Zulu, probably by King Shaka (reigned 1816–28). Shaka developed a formation called the "charging bull" or the "bull horn." The chest of the bull was a mass formation of warriors that would directly assault the enemy force, pinning them in place. Two wings of additional infantry, the horns, would then execute a double envelopment of the enemy formation. Behind the chest additional warriors were placed to reinforce the front line. Finally, a reserve force was stationed to the rear to act as a quick reaction force in case either of the horns should fail or the chest needed additional mass.[15]

Perhaps most importantly, mass is never about pure numbers. The quality of those numbers matters greatly. The numbers of the entire Iraqi army were to little avail in 1991 and in 2003 against far superior troops. In recent years, especially in Western doctrine, it has been fashionable to frame mass in terms of effects, as in the massing of the effects of supporting arms: artillery, close air support, electronic warfare, cyber warfare, and so on. This idea certainly has merit: the massing of such effects can have a better result than piecemeal efforts, but the use of firepower has its own role in tactics.

5

FIREPOWER

God fights on the side with the best artillery.

—Napoleon Bonaparte

Despite the Spartans' view that missile weapons were cowardly, man has sought for thousands of years to kill from afar. The atlatl, a spear-throwing device, dates back 400,000 years, predating the sword and metal weapons. It was born of a desire to kill without risk, the same impetus behind the development of armed drones today. Still, most observers see close combat as the more glorious method, whether it occurs between phalanxes, regiments of bayonets, or the individual hand-to-hand combat skills still practiced by soldiers today.

The allure of missile weapons was never quite overcome; even the Spartans eventually began to employ *peltasts,* lightly armored troops carrying javelins. But in the pre-gunpowder age, missile weapons could only provide support to the more decisive heavy infantry equipped for close combat. Xerxes could blot out the sun with his arrows, but he could not break the Spartan line at Thermopylae with missile fire alone. Catapults and other siege weapons could bring down walls, but infantry still needed to assault through the breach. Even Joshua's army, aided by divine instruction, still had to storm Jericho after its trumpets had brought down the walls.

The most effective use of firepower in ancient warfare was its combination with maneuver through the marriage of horse and rider.

Militaries that utilized horse archers, such as those of the Persians and eventually the Mongols, managed to make firepower effective even without gunpowder. (Although the Mongols might have been one of the first military forces to use gunpowder, their main weapon was the bow.) In the Middle Ages the mounted knight dominated the battlefield with direct massed charges that inflicted shock on the force opposing them. (See chapter 10.) The Battle of Crécy in Normandy during the Hundred Years' War was an important turning point in the evolution of tactics as firepower began to dominate armored mass. In the summer of 1346, King Edward III of England landed forces in France to assert his claim to the French throne. For over a month, the English army ravaged the French countryside, burning or seizing crops and destroying villages in an effort to draw the French army into a battle. When the French army did arrive, they numbered around 25,000 troops while the English had only around 12,000. The English arrayed in three lines on a commanding position and waited for French attacks. The battle opened with an exchange of arrow fire but the English were equipped with longbows and their archers were capable of firing five to six arrows per minute. The French mainly used crossbows that at best could fire two bolts a minute. Additionally, the English longbow had a much greater range, so while English arrows rained down on the French, the crossbow bolts could not even reach the English lines. In response, the French knights charged the English but the charge was broken by the steady arrow fire. Plate armor could not protect against arrows fired from the powerful longbows. Additionally, the English had primitive cannons that were loaded with bits of metal. The cannons did little damage in comparison to the longbows, but to troops inexperienced with gunpowder the psychological effect must have been devastating. The French repeatedly charged into the English lines, but every attempt was defeated by English firepower. The French army suffered massive casualties, including 1,542 knights and squires killed, an astonishing number of casualties for a medieval battle.[1]

The gunpowder revolution unlocked the Pandora's box of missile weaponry, although for a time the dynamics in combat remained the same. Marksmen, like archers, needed to be concentrated due to inherent inaccuracies and weak punch. In modern times virtually every person on the

battlefield has a ranged weapon in the form of a firearm. For this discussion, then, it is important to point out that by "firepower" in modern warfare, we mean ranged firepower in the form of air support, indirect fires, and crew-served weapons. Firepower is the ability to apply ranged weapons at an advantage against enemy forces. This chapter is more applicable to supporting arms than the modern personal weapons of individual soldiers.

The use of firepower has been in the forefront of naval commanders' minds for centuries, and gunpowder weapons especially had a drastic effect on naval tactics. The evolution of naval tactics based on firepower is demonstrated by the preferred formation of naval commanders. In the words of Capt. Wayne P. Hughes Jr., U.S. Navy (Ret.), "Although the column was the admiral's tactical formation during both periods, in sailing ships firepower had to be concentrated in the ship because gun range was so short, while in battleships firepower of an entire column—the firepower of every ship—could be concentrated. When the big gun dominated, it was a weapon range that made 'capping the T' so advantageous; instead of a single ship of the line in raking position, the whole fleet could concentrate fire on the enemy van."[2] Thus, potential firepower enabled by technology determines the ideal forms of maneuver and methods of mass available to the tactician for a given engagement.

For most of military history, firepower was most effective when combined with either mass or maneuver or both. This began to change in the late nineteenth and early twentieth centuries, and was first evident in the Crimean War. The infamous Charge of the Light Brigade was the death knell of the cavalry charge. Similarly, in the Boer War British troops still walked upright toward an enemy that was employing rifles and modern artillery. This method had been suicidal for quite some time against massed, entrenched troops in fortification—Bunker Hill in 1775 for example—but now the Boers did not always need to construct fortifications. Hiding among earth and foliage was sufficient, and troops could spread out to take advantage of that camouflage without sacrificing firepower.

This dynamic interplay between the destructive force of firepower since the industrial revolution and various ways to mitigate its effects is arguably the story of twentieth century tactics. Maj. Gen. Robert Scales, U.S. Army (Ret.), has written, "For the last fifty years, the militaries of the Western

powers . . . have been remarkably consistent in how they have chosen to go to war. . . . We increasingly seek to develop a method of war that will replace manpower expenditure with an ever multiplying expenditure of firepower."[3]

Scales then goes on to describe the "ever-increasing" firepower of the United States; he describes each enemy, starting with the Japanese in 1943 and tracing the thread down to the Serbs in Kosovo, and how that enemy continually adapted to the firepower threat. His focus, however, is much too narrow. This competition between firepower and mitigation stretches much farther back in history and is certainly not limited to the United States. The dominance of the mounted knight was ended by the crossbow and the English longbow. The castle was brought down by artillery. Then fortifications outpaced gunpowder and forts were developed to withstand artillery. Forts lasted until 1914 when the German army used a 420-mm howitzer (most howitzers today are around 155-mm in caliber) firing 2,000-pound shells to literally pulverize Belgian forts, which were then the most modern in Europe.[4] Combatants then built down instead of up to escape the steel rain, producing the gargantuan trench systems of the western front. By World War II the advent of the tank and effective close air support meant that giant, almost immobile artillery pieces became targets themselves. Soldiers increasingly turned to camouflage and covered approaches for protection. Speed became protection. So-called guerrilla warfare increased in prevalence. In Vietnam the North Vietnamese Army (NVA) used tunnels, underground barracks, and the thick vegetation to avoid aerial bombardment. In Afghanistan the Taliban and al Qaeda took to caves. Other groups use human shields by hiding among civilians in population centers. This is particularly common among terrorist groups in the Middle East like Hamas and Hezbollah but it has occurred elsewhere, like Chechnya.

There are two points made by this admittedly shallow skip through the history of firepower in warfare. One, tacticians constantly adapt to the use of firepower; and two, that firepower is rarely, if ever, effective by itself. The Allies can raze Dresden and Tokyo, but the Japanese and German enemy can always go on if their forces survive, and those forces have ways to mitigate the effects of firepower. These include fortification, armor, cover and concealment, and dispersal.

The first three are nearly self-explanatory. Whether castles, caves, or foxholes, fortifications protect troops from enemy fire. Armor can be placed on tanks or torsos. Cover is anything, such as a concrete wall, that hinders enemy sight and fire, while concealment hinders only sight.

The fourth, dispersal, is a dilemma. We have seen how nearly every military teaches its tacticians to mass forces, but dispersal is the exact opposite of massing. In fact, dispersal is necessary to survive the modern battlefield. David Chandler, in *The Campaigns of Napoleon,* described how much of Napoleon's success was due to the mastery of the interplay between mass and dispersal: "By reconciling the advantages and disadvantages of mass and dispersal in this way, and fusing these two contradictory elements into a single operation of war, Napoleon revealed his true genius as a military master-mind."[5] Today, dispersal does not just offer advantages but is sometimes the only way to mitigate the effect of enemy firepower.

Dispersal is rule one in guerrilla warfare, and insurgents in both Iraq and Afghanistan have used it to survive American firepower in recent years. They concentrate only to attack a chosen target, then disperse again. One example is the Battle of Wanat in 2008 in Afghanistan. In that battle, two hundred to five hundred Taliban fighters surrounded and assaulted an isolated outpost manned by forty-nine U.S. Army soldiers and twenty-four Afghan soldiers.[6] Although the out-manned defenders suffered major casualties, they were able to successfully defeat the Taliban attack through the use of firepower, including heavy mortars, antitank guided missiles, artillery fire, and close air support.[7]

This does not just occur among guerrillas but among conventional militaries as well. Massing at the wrong place and at the wrong time is suicidal in modern warfare, thanks to modern firepower. The concentration of force is typically just the creation of a perfect target for the concentration of fires. Dispersal, cover, concealment, and armor are necessary to mitigate the effects of enemy firepower. According to Steven Biddle, "The more fluid conduct of the modern system defense demands much the same exposure—reduction tactics of cover, concealment, dispersion, suppression, combined arms, and independent small unit maneuver that modern system

attackers require, albeit adapted to the particular problems of the defense."[8] Both soldiers and guerrillas must master the art of massing to strike and dispersing to survive.

While firepower is a potent weapon, it is best used in combination with other tactical tenets. Simply blasting an enemy out of existence is rarely possible. But firepower combined with mass or maneuver is extremely effective. Indeed, firepower employed to suppress or fix an enemy is sometimes necessary to facilitate maneuver. Perhaps the best example of such a combination is the famous naval tactic of "crossing the T."

This tactic was a method whereby one fleet would be positioned to maximize its own firepower while minimizing the firepower effect of the opposing fleet. Enemy fleets would typically deploy in lines of ships to facilitate communication. The acme of skill for the naval commander was to maneuver his battle line so that it forms the top of the "T" and the enemy fleet formed the stem. When this occurred, the fleet that had maneuvered to cross the T was able to mass its firepower on the leading ships of the enemy fleet while only the first or the first few enemy ships could respond in kind. The rest of the trailing fleet could not effectively fire for fear of hitting their own ships ahead of them in line.

This occurred twice during the Battle of Jutland in 1916 between the British and German navies but the most successful application of this tactic was by Vice-Admiral Heihachiro Togo of the Imperial Japanese navy at the Battle of Tsushima Strait in 1905. After the virtual destruction of the Russian Pacific Fleet earlier in the Russo-Japanese War, the Russian Black Sea Fleet was ordered to steam west out of the Mediterranean, around the Cape of Good Hope, and eventually to the Russian port of Vladivostok in the northern Pacific Ocean. Well aware of this fact, Togo had months to plan and prepare the Japanese fleet to intercept them. After a brutal six-month-long journey of 18,000 nautical miles, the Black Sea Fleet was caught by Togo just as it passed through the strait around the island of Tsushima off the Korean coast, three hundred miles short of Vladivostok. In the first meeting at around 2:00 in the afternoon, fully five hundred Japanese guns were firing on the Russian flagship, the *Suvarov,* with fifty-two total guns, and the next ship in line, the *Oslyaba,* with sixty-one total guns.[9] The Russian sailors fought gallantly the rest of the day, but the

merciless Japanese fire eventually sunk even the biggest armored battleships. Japanese torpedo boats harried the now surrounded Russian fleet throughout the night. The next day, 28 May, the Black Sea Fleet surrendered.

Firepower has become extremely important to naval tacticians in the missile age. Modern fleet battles can come down to whose missiles have the range and accuracy to hit their targets first. During the Yom Kippur War in 1973, Israeli Gabriel missiles had a range of only twelve miles while Soviet-produced Styx missiles used by Egypt and Syria had a twenty-seven-mile range.[10] The Israelis compensated for this deficit in firepower by using electronic jamming and decoy rockets to disable the Styx missiles until they could close within twelve miles of Syrian and Egyptian missile boats.[11]

Firepower has also undergone a renaissance along with the development of airpower. The range, maneuverability, and striking power of aircraft is unmatched on the modern battlefield. A stark example of this is the Battle of Khe Sanh in 1968. During the NVA and Viet Cong offensive known as the Tet Offensive, a powerful NVA force was assembled to attack the U.S. Marine base at Khe Sanh, which housed an infantry regiment, the 26th Marines, and an artillery battalion. The NVA troops seized high ground around the small Marine base and pummeled it with indirect fire. The situation instantly drew comparisons with Dien Bien Phu, the 1954 battle in North Vietnam where the Viet Minh surrounded the French and bombarded them with artillery fire from surrounding heights until they surrendered. The difference, though, was that the use of airpower had advanced by leaps and bounds in the intervening years. The Marines at Khe Sanh executed a stalwart defense and the artillery battalion fired 160,000 shells during the three-month siege, but the real firepower story was that of American airpower.[12]

Air-delivered firepower was brought to bear in the form of Arc Light raids. The raids included a variety of aircraft from as far away as Japan but featured most heavily the U.S. Air Force's Boeing B-52 Stratofortress strategic bomber used in a tactical role. The United States was able to generate six B-52 sorties every three hours, enabling the use of an astounding amount of firepower. After three months, the 30,000-strong

NVA took upward of 50 percent casualties and then withdrew. They were never able to generate enough mass to launch a significant assault on the base itself. The key role of firepower in this case was described best by historian Robert M. Citino: "The 'Arc Light' raids delivered the equivalent of a 1.3 kiloton blast—in other words, a small nuclear weapon—on NVA positions every single day of the siege. Put another way, each of the approximately thirty thousand NVA soldiers at Khe Sanh got his own personal five tons of high explosive."[13]

Another important aspect of firepower is combined arms. As discussed in chapter 3, the combined arms concept stretches back to Philip II of Macedon. A phalanx may be strong in front, but it is vulnerable to maneuver against its flanks or rear. The idea behind combined arms is to create a tactical dilemma for the enemy. For example, if the enemy can be struck by direct fire weapons such as rifles, machine guns, and missiles, he will typically take cover or otherwise mitigate the effects of those weapons. But if indirect fires, such as mortars, artillery, and aviation fires, can also strike him from above, the enemy is in a dilemma. Either he remains in one place and subjects himself to bombardment or he attempts to maneuver and is struck by the direct fire weapon systems. Generally, balanced military forces with various types of arms that complement and cover each other's strengths and weaknesses are more successful.

As the power and reliability of firearms increased over time, so did the importance of combining mass, firepower, and maneuver. During the early premodern period, the Spanish developed the *tercio,* a formation in which soldiers equipped with firearms were combined with pikemen into squares. This method massed the firepower of the gunners while the pikemen protected them from cavalry charges which slow-loading firearms could not defeat. The *tercio* was in turn improved on by the Swedish king and legendary general Gustavus Adolphus. Adolphus trained his army to form up in alternating squares of infantry and cavalry in a checkerboard pattern. This combined the maneuverability with the steady mass of infantry. He also increased the firepower of his soldiers by training them in teams of five: the first soldier in line would kneel to fire and the second in line would fire over his head. The pair would then go to the end of the line to reload while two more took their places. This method presented the enemy with

constant fire rather than intermittent fire.[14] The checkerboard pattern also made his formation flexible and able to turn quickly to meet unexpected threats.

At the Battle of Breitenfeld on 17 September 1631 during the Thirty Years' War, Adolphus' tactics worked exactly as he had hoped. When the cavalry forces of the Catholic army he was facing charged his right flank six times, they were caught between his squares each time and forced to retreat. When allies on his other flank retreated and exposed the entire line to a flanking maneuver, the Catholic forces attacked in force. The Swedish squares on the left flank quickly wheeled to meet the attack; the increased firepower produced by Adolphus' well-trained gunners caused so many casualties that the Catholic forces virtually disintegrated. The Catholic army fled to nearby Leipzig, leaving artillery and their wounded behind as the Swedish troops chased them down.[15]

The modern application is the use of a variety of weapon systems to overcome the advantages and disadvantages of the enemy's weapons. A tank cannot usually be stopped by machine-gun fire, so tanks can directly attack an entrenched line of infantry. But close air support can destroy the tank while the tank cannot effectively fire at aircraft. This application of appropriate weapon systems that take advantage of inherent strengths and weakness of other weapon systems is an integral part of modern tactics, as it has been for centuries. The key to modern combined arms is the close integration of firepower and maneuver so that each supports the other. This coordination requires excellent training and a decentralized command and control system that allows frontline leaders the ability to leverage firepower on the spot based on local battlefield conditions with a minimal amount of delay. (See chapter 14.) Communication and coordination together are the key to the effective use of firepower. When describing the state of such tactics during World War I, military historian Sir John Keegan stated, "What had not been perceived is that firepower takes effect only if it can be directed in timely and accurate fashion. That requires communication. Undirected fire is wasted effort, unless observers can correct its fall, order shifts of target, signal success, terminate failure, co-ordinate the action of infantry with its fire support. The communication necessary to such co-ordination demands, if not instantaneity, then certainly the shortest possible

interval between observation and response."[16] The armies of the early twentieth century did not have the technology to use firepower and maneuver to its greatest potential, but the most successful modern forces master the art, whether the firepower comes in the form of close air support or vehicle-borne improvised explosive devices. The concept at play is not different from the preparatory artillery bombardments of World War I: hit the enemy with as much firepower as possible before sending in the infantry. The only difference is the delivery mechanism.

In combat, both sides seek to employ maneuver to mass firepower and force against an appropriate point in the enemy's disposition. Since both sides seek to accomplish this feat, victory will usually go to the side that can do it first and most often. The next tenet, tempo, can sometimes be the difference between victory and defeat.

6

TEMPO

Damn the torpedoes, full speed ahead!

—Adm. David Farragut

The final physical tactical tenet is tempo. It is rarely reflected on lists of the principles of war and if it is, it is most frequently depicted as speed. More often than not, being faster than your enemy is better than being slower but, occasionally, it is advantageous to hold out longer than your enemy, to delay the decision of battle until reinforcements or allies arrive, or until some other factor tilts the probability equation back in your favor. The tactician, then, should not blindly pursue speed in every case but should consider the dimension of time and whether time is in his favor or not. Tempo is the ability to control the pace of combat to your advantage and the disadvantage of the enemy. The only major theorist to truly grapple with the dimension of time in tactics is John Boyd.

Tempo was central to Boyd's ideas from the start. After seeing aerial combat in the Korean War as an F-86 pilot, Boyd attempted to ascertain why some pilots won and others lost in dogfights. He determined that it was not the speed of the aircraft that led to success in aerial combat but the speed of the situational awareness of the pilot and the responsiveness of his aircraft to his decisions. If a pilot knew his opponent's position and his velocity, he could determine what maneuvers the enemy could employ and then counter them. In 1960, while he was assigned to Nellis Air Force Base

as an instructor, he codified aerial combat tactics in a manual titled "Aerial Attack Study"; the U.S. Air Force made it its official manual on the subject later that year.[1] Later, he would apply this basic idea to warfare itself.

But the nature of war itself works against speed. Clausewitz identified the inherent friction in war. The immense complexity of coordinating sometimes millions of people and animals, each with an independent will, the forethought required to time deployments down to the man, the meal, the munition, to the train axle, the force of will required to be summoned by the one soul with power over the whole machine, is overwhelming. Every question, every delay, every layabout private and shifty sergeant, every order countermanded by meddling and uncertain officers contributes to an immense friction infecting the military machine and preventing it from pursuing its purpose. The inherent friction in military operations can be mitigated by training, efficient procedures, and repetition, but it can never be eliminated. The paralyzing fear and blanketing confusion that accompanies actual combat magnifies this friction to an almost literal, physical level. This phenomenon is nearly indescribable for those who have not been in the midst of it and heard the crack of enemy rounds in the air.

The word *friction* is Clausewitz's way of describing it and it is nearly perfect. He saw the combination of human factors that are inherent in warfare as preventing war from reaching a state of total perfection. And fortunately so. In his view, it was the job of strategists and tacticians to overcome this friction.

But Boyd took the concept one step farther. In the margins of his copy of Clausewitz's *On War,* Boyd wrote that this phenomenon could be used against an enemy.[2] Where Clausewitz wanted to overcome friction, Boyd wanted to exploit it, to use it as a weapon. A pilot experiencing some kind of stress would be less able to predict and outmaneuver his opponent. So too an enemy commander of any kind. If the enemy general is consumed with overcoming his own friction (some of which was imposed by his enemy), he will fail to outmaneuver and outthink his opponent.

Boyd applied the term *entropy* to combat. Entropy means "the measure of a system's thermal energy per unit temperature that is available for doing useful work."[3] Applied to warfare, the energy expended by a military in overcoming friction—the countermanded orders, the fear, the tension, the

lazy subordinate, and so on—is unavailable for fighting the enemy. Friction thus reduces the overall potential energy that can be applied toward victory. Boyd believed that if you could magnify the entropy of the enemy through deception, attrition, and most importantly the ability to make and implement decisions faster than the enemy can comprehend and react to them, entropy would overcome the enemy's inherent energy and cause collapse or paralysis . . . that is, as long as you could overcome your own entropy.

The practical method that Boyd used to convey this concept is the OODA loop. The OODA loop is frequently portrayed as a method for leaders in combat to make decisions as quickly as possible. You observe the tactical situation, you interpret it through your knowledge base to understand and orient on it, you decide how to act in this situation, and then you act on that decision. Observe, orient, decide, act. The side that cycles through these steps faster than the other will succeed. This is all well and good for the tactician to understand and organize his decision-making process, but how does he interfere with the enemy's?

The first way to interfere with the enemy's decision-making process is to simply be too fast for him to react. Combat forces have constantly sought to gain an advantage over their enemy from speed whether it be through training horses for cavalry duty, attaching a chariot, installing stirrups, or adopting motorcars or tanks or biplanes or jets. Boyd says if you move and decide faster than your enemy, you will win.

But in some cases a slower tempo can be advantageous. To return to Clausewitz, he described war as a contest of wills. Each side attempts to impose its will on the other. But in some cases combatants are unable to outright impose their will on the other. In this case, war becomes a struggle of outlasting wills: one side must maintain its will longer than the other. In *Military Strategy,* Adm. J. C. Wylie described two forms of strategy: sequential and cumulative. A sequential strategy is "a series of discrete steps or actions, with each one of these series of actions growing naturally out of, and dependent on, the one that proceeded it." A sequential strategy is essentially a step-by-step method of defeating the opponent. A cumulative strategy, however, is different: "But there is another way to prosecute a war. There is a type of warfare in which the entire pattern is made up of a collection of lesser actions, but these lesser or individual actions are not

sequentially interdependent. Each individual one is no more than a single statistic, an isolated plus or minus, in arriving at the final result."[4]

These two different strategies are sometimes also called annihilation (sequential) and exhaustion (cumulative). The difference is tempo: whether actions occur linearly in time or all at once. A sequential strategy is akin to going through a recipe step by step while a cumulative strategy is more akin to boiling a pot of water. One side steadily raises the temperature until the boiling point is reached . . . or until the opponent's entropy overwhelms him.

The dynamics of a strategy of exhaustion is most obvious in small wars. Henry Kissinger's statement, "The guerrilla wins if he does not lose. The conventional army loses if it does not win," is a recognition of this.[5] Kissinger was wrong though: when strategies of exhaustion are being employed, either side could lose its will to continue, and thus lose. There are examples of such defeats of both guerrilla armies and conventional forces. Just such a dynamic occurred in the Vietnam War that Kissinger was describing. The war was unpopular and eventually the American people lost the will to tolerate political leaders who would continue it because the military was unable to decisively defeat the NVA with the political constraints imposed on it. After the U.S. military was withdrawn from South Vietnam, the NVA was free to pursue its political aim: unification under Hanoi.

The North Vietnamese strategy of exhaustion was expressed at the tactical level in their use of tempo to quickly hit U.S. forces without exposing themselves too much to superior firepower. They called their method "one slow, four quick."[6] The NVA would take their time planning major attacks, including a withdrawal plan, and building up their forces to wait for an opportunity. When they launched an attack, they would perform four actions in rapid succession: a dispersed infiltration, a sudden concentration, a fast massed attack, and then a planned withdrawal with preplanned ambushes to slow down the American response. By the time U.S. forces were able to shift units around, send reinforcements, and dial in fire support and counterattack, the NVA would be gone.

Strategies of exhaustion do not occur only in irregular wars, however. In World War I it was the Entente's superior ability to withstand the war—both

the casualties and the financial and economic strain—that eventually brought victory over the Central Powers.

For the tactician, though, time is a weapon. He might choose different tactics—or execute his mission at a different time—based on whether he is in the midst of a sequential or cumulative strategic effort. He must be cognizant of the temporal aspects of the strategy: for instance, he might need to minimize his own casualties based on the strategic precepts of the situation. He must also gauge whether time works for or against him and his opponent (or whether time works for both or neither side). For example, if the enemy is known to have ready access to reinforcements, then time is against him and he must take action sooner rather than later. If the situation is reversed and his reinforcements are close at hand, then it is advantageous that he delay coming to grips with the enemy until reinforcements arrive.

The best conflict to exemplify this dynamic is the Second Punic War. By the end of 217 BC the senate of Rome was in a panic. The Carthaginian general Hannibal had marched from Spain over the Alps and into Italy, destroying two Roman armies along the way, one at the Battle of the Trebia and another at the Battle of Lake Trasimene. In response, the Roman senate suspended the normal operations of the constitution and appointed Quintus Fabius as dictator with Marcus Minucius as master of horse (the dictator's second in command).[7]

Through a wise assessment of the strategic situation, Fabius developed a bold tactical plan. Hannibal's troops had trained for warfare all their lives and now were seasoned veterans that had twice defeated Roman armies. Despite this, they were in Italy and thus surrounded by Roman allies, dependent on foraging and pillaging for supplies and sustenance. By contrast, Fabius' Roman army was inexperienced. Because of the high number of casualties already sustained by Rome, the troops had been hastily raised and lacked any experience with fighting. By virtue of the fact that they were fighting in Italy, though, they were well supplied and surrounded by allies. Fabius decided not to fight a pitched battle with Hannibal and instead avoided such fights. Instead, he attacked only foraging parties and small Carthaginian detachments, inflicting casualties that Hannibal could not replace while Fabius could easily replace his casualties. Fabius realized that time was on his side and that a slow tempo

would wear Hannibal down while simultaneously allowing his own troops to gain experience and confidence. Unfortunately, most Romans disagreed with Fabius' plan. Minucius wanted to fight Hannibal directly and even accused Fabius of cowardice.[8]

After Fabius' term in office expired, two consuls were appointed to take over the war effort. One, Gaius Terentius Varro, was inexperienced and rushed into battle instead of following Fabius' advice. At the Battle of Cannae on 6 August 216 BC, Hannibal conducted a double envelopment of the numerically superior Roman force and destroyed them, killing 70,000 Roman soldiers in one day.[9] Rome's allies who had thus far remained loyal now began to defect to the Carthaginians.

By 203 BC, however, the tables had turned. By returning to Fabius' tactics of avoiding major fights with Hannibal, Rome had completely eroded Carthaginian gains by defeating other Carthaginian forces. Spain had been largely reconquered and Hannibal was once again isolated in an unfriendly Italy. These gains were largely due to Publius Cornelius Scipio, a young Roman general who had proven to be a match for Hannibal. Time was still against Hannibal, but in the intervening decade since Cannae, the Roman legions had gained a wealth of experience and regained their confidence through repeated victories. Scipio realized that a slow tempo was now unnecessary and resolved to invade Africa, ignoring Hannibal. When he did so, Hannibal was recalled from Italy and the threat to Rome presented by his army was void. Hannibal and Scipio faced each other at the Battle of Zama in 202 BC outside Carthage where Hannibal was soundly and finally defeated.

Hannibal, Fabius, and Scipio all understood the value of tempo and how to use it as a weapon in battle. Hannibal knew that time was against him and thus he repeatedly sought large-scale direct battles to try and win the war as soon as possible. Fabius recognized that by avoiding those direct battles he could weaken Hannibal and wait until Rome could regain its physical and moral strength. Scipio realized correctly when Rome had regained its strength and when Carthage was on its last legs. This assessment of the temporal aspects of the tactical situation is a key component of any tactician's plans.

Siege warfare is almost entirely based on time, imposed on the combatants by the strength of one side's fortifications. By cutting off an enemy ensconced in a fortress, castle, or city, you make time work against him. The demands of life—water and food—will force him to either abandon his position or capitulate. Sieges, however, are difficult to maintain and the besieging force can be compelled to force the issue as well if time is not on its side.

By now it should be obvious that none of these tactical tenets work in isolation from each other. They are combined and recombined by tacticians based on the situation they find and the environment in which they operate. High-level U.S. military documents frequently call for or describe achieving synergy among U.S. military forces, particularly among branches. A more apt goal would be to achieve symbiosis.

In the animal kingdom, symbiosis describes a mutually beneficial relationship between two dissimilar organisms. It might be a reptile and a bird, for instance: the crocodile cannot clean its teeth, but the Plover bird can and gets an easy meal in the process.

So, too, among military forces. In ancient armies, armored infantry provided mass and protection to cavalry and light troops such as archers and *peltasts* who in turn supplied mobility and ranged firepower. Elephants (in the case of Carthage) and *cataphracts* (in the case of Persia) were the tanks of the ancient world, able to punch holes in the massed ranks of enemy infantry.[10] In modern armies motorized troops or heliborne troops have replaced cavalry and artillery, mortars, and aircraft supply ranged firepower. The most successful military forces in history have all used a mix of forces with strengths in mass, maneuver, firepower, and tempo that can operate in a symbiotic manner. Alexander the Great's Macedonians, the Roman legions, the Mongol hordes, Napoleon's corps system, the German panzer divisions, and the modern Marine Air Ground Task Force and Army Brigade Combat Teams all operate on this basis. Even the vaunted Spartans —who abhorred both cavalry and light infantry as cowardly—eventually learned to employ both . . . but only after suffering numerous defeats.

The physical means of defeating the enemy are not isolated from the mental and moral effects on the enemy either. Now that we have described the four basic physical methods of gaining an advantage over the enemy, we

must examine the mental and moral effects that these actions cause among his troops and in his mind.

7

DECEPTION

All warfare is deception.

—Sun Tzu

Deception is one of the most powerful and oldest weapons at the tactician's disposal. Homer's *The Iliad* is a mythological depiction of how the Greeks might have won the ten-year-long siege of Troy in the eleventh or twelfth century BC. Due to the walls surrounding the city of Troy, the Greeks' physical combat power was not enough to overcome the city. The Greek leader Odysseus developed a plan where the Greeks would feign a retreat while leaving an offering of a giant wooden horse behind. The Trojans wheeled the horse into the city; inside this horse a group of Greek soldiers waited until night and then opened the gates to the returned Greek forces. The Greeks took the city. Troy fell not to the sum total of the physical combat forces arrayed against it by the Greeks, but to Odysseus' clever plan to deceive the Trojans. Deception is the manipulation of the enemy's understanding of the situation in order to achieve an advantageous situation.

Sun Tzu is one of the strongest proponents of deception, as the quote above shows. He extols its readers throughout his book, *The Art of War,* to strike the enemy where he is unprepared, weak, or not expecting an attack. Even Sun Tzu's thoughts on mass show the character of deception: You disperse to cause your enemy to disperse, then concentrate to strike. During

maneuver: “March by an indirect route and divert the enemy by enticing him with a bait.”[1]

What this focus on deception boils down to is the concepts of the *cheng* and *ch’i. Cheng* translates to “normal” or “direct” and *ch’i* translates to “extraordinary.” To understand these concepts, however, one must look to Sun Tzu’s explanation: “Generally, in battle, use the normal [*cheng*] force to engage, use the extraordinary [*ch’i*] to win.”[2] Use the *cheng* to engage the enemy’s attention or fix his troops while using the *ch’i* to strike him. A real-world example of this is the Russian concept of *maskirovka,* a word that translates to “camouflage.” As part of the Soviet *maskirovka* effort on the Eastern Front during World War II, the Russians produced thousands of fake tanks, artillery pieces, buildings, and even fake roads. German intelligence was fooled into thinking some fake units actually existed and completely missed the existence of real units in other areas. The Russians also reinforced their lines at night to avoid detection. At one point, the Germans attacked in an area where they expected to face 1,800 tanks and artillery pieces. Instead they faced 5,200.[3] Deception occurs even at the individual soldier level. Camouflage uniforms, noise and light discipline, and other forms of concealment all are used to deny to the enemy perception of reality.

John Boyd adopted the *cheng* /*ch’i* concept from Sun Tzu. Boyd believed that the thermodynamic concept of entropy can be applied to military in conflict and that the greater the mismatch between the enemy’s view of reality and actual reality—caused by the opponent’s efforts to deceive, misinform, and mystify—the greater their level of entropy and the less effectively they can function and they eventually collapse, no longer able to function as a coherent organization.

However it is described, deception is a powerful means by which to gain an advantage over the enemy. Again, there is no real division between this mental trick and physical action: the tactician can use mass (*cheng*) to deceive the enemy into orienting his defensive line in one direction while using a maneuver force (*ch’i*) to strike the now exposed flank. The mental effect of deception is achieved through the physical tactic of mass.

Any time the enemy is deceived, it produces mental shock and infects his discriminating process. During the Second Punic War, Hannibal had

sticks tied to the horns of seized cattle then had the sticks lit and the cattle driven at night to key terrain near his position. When a Roman army under Fabius Maximus moved to attack what they perceived as the main Carthaginian body, Hannibal led his soldiers through a now undefended pass and away to safety.[4] At the Battle of Sa'ari Steppe during his rise to power, Chingis (or Ghengis) Khan was outnumbered when invading a rival tribe's territory. At night, he had every Mongol warrior light his own campfire instead of allowing them to build fewer fires for the use of a group of soldiers, multiplying the number of fires in the camp. The rival clans, seeing the multitude of campfires and assuming that each one served more than one soldier, believed themselves outnumbered and they declined to attack.[5] This gave Chingis more time to prepare his position; when the rival clan eventually did attack, Chingis crushed it.

Naval commanders have also used deception to great effect. At the Battle of River Plate in 1939, three Royal Navy cruisers—the *Ajax,* the *Achilles* (crewed by New Zealanders), and the *Exeter* (a heavy cruiser)—confronted the German battleship *Admiral Graf Spee* in the South Atlantic off the coasts of Uruguay and Argentina. After an extended gunnery duel in which all four ships were heavily damaged, the *Graf Spee* made for the port of Montevideo. During the chase the *Graf Spee* sent a false request for assistance to the British ships as if it were a British merchant vessel that was in the area to slow their pursuers down, but the British ships saw through the ruse. The *Exeter* was so damaged that it steamed for Port Stanley for repairs, leaving the *Ajax* and the *Achilles* in pursuit of the much larger battleship. Upon reaching Montevideo, Uruguay allowed the German ship the seventy-two hours of safe harbor. Both ships were low on fuel and ammunition and were also damaged, but another cruiser, the *Cumberland,* arrived to reinforce them.[6] Another full task force of ships was also on its way to reinforce, but they were too far away to reach Montevideo in time. In response, the British Admiralty released reports that British battleships were already in the area. The captain of the *Graf Spee,* Captain Langsdorff, in consultation with Berlin, decided to scuttle the ship since the odds seemed to be so much against him.[7] Rather than face Hitler's wrath, Langsdorff committed suicide.

Even diplomatic efforts can be used to deceive the enemy. Unsurprisingly, Napoleon mastered using diplomatic deception to produce tactical advantage in battle. Prior to the Battle of Austerlitz in 1805, he took numerous steps to convince the allied coalition that he was weak and wished to avoid battle. He moved almost half of his forces away from his main forces to provide a tempting target for the coalition, he abandoned strong defensible positions to make the enemy feel more comfortable in attacking, he enthusiastically accepted a truce offered by the emperor of Austria, and at negotiations with enemy diplomats he feigned nervousness and worry. When the allies were convinced that Napoleon was weak and attacked at Austerlitz, Napoleon sprung his trap with his now concentrated forces and destroyed the army of the Third Coalition.[8]

Deception still applies in large-scale, technologically advanced warfare. During Operation Desert Storm in 1991, the massive Coalition force assembled to eject the Iraqi army from Kuwait employed no fewer than three deception efforts planned at the highest levels. The first included a planned amphibious invasion into Iraq itself with the forces that would have carried it out stationed offshore. This forced the Iraqis to commit forces to defend their shore. The second involved a division-sized feint by the 1st Cavalry Division in a sector where the Iraqis were expecting an attack. The third was a breach of Iraqi lines and a drive toward Kuwait City, an obvious target.[9] These deception efforts supported a massive envelopment by the VII Armored Corps and the XVIII Airborne Corps on the Iraqi right flank that caught them completely unprepared. Twelve years later during the opening phases of Operation Iraqi Freedom, the United States deliberately kept shipping military equipment toward Turkey even though Turkey had denied the United States permission to use the country as a route to invade Iraq. This convinced the Iraqis that an attack from Turkey was still forthcoming, and they assigned thirteen divisions to northern Iraq to meet it.[10] These Iraqi units were thus unavailable when the Coalition forces invaded Iraq from the south. These are just a few examples of commanders deceiving the enemy and thus changing the tactical equation in their favor.

Sun Tzu's statement that "all warfare is deception" is easy to understand. A plan known to the enemy is one that the enemy can counter. Deception corrupts his mind by replacing reality with a false image

designed by the opposing tactician. While the tactician raises the probability of success through his use of deception, he also hides the true equation from his opponent.

8

SURPRISE

> The unexpected cannot guarantee success, but it guarantees the best chance of success.
>
> —Sir Basil H. Liddell Hart

Surprise is a companion to deception because effective deception facilitates surprise. The two concepts, however, deserve to be treated separately. Ambushes might involve deception, but even if the target is not deceived he is usually surprised to suddenly find himself in combat. Surprise in combat is the act of presenting your enemy with a situation or capability for which he is mentally unprepared.

A tactical plan that integrates both deception and surprise is particularly potent. For example, at the Battle of Cowpens in 1781 between Colonel Banastre Tarleton's British legion with allied Tory militia and colonial forces under Daniel Morgan, Morgan used deception to achieve surprise that routed the British forces in an hour. Morgan used a planned retreat by the patriot militias in his first two lines of troops. The ruse reinforced Tarleton's preconceived bias against the reliability of militia, convincing Tarleton that he had won. After convincing Tarleton of one thing (an easy British victory), Morgan sprang the trap. His more reliable colonial infantry, formed up on the patriot militia's line of retreat behind a crest, confronted the pursuing British troops and routed them. The surprised British infantry collapsed and other British units refused to even join the battle so

completely was their mentality affected.[1] Morgan used *cheng* (his militia units) with *ch'i* (the concealed colonial regulars), together with favorable terrain, to mentally undo Tarleton's veteran British legion with surprise.

Surprise is the major ingredient in a successful ambush, along with mass, firepower, and usually maneuver. In a well-planned ambush, one moment the targets are safe and the next they are outnumbered, under fire, and flanked or even surrounded. Bing West describes a successful insurgent ambush of Marines in Fallujah in early 2004:

> One moment they [the Marines] were sitting in the living rooms and kitchens drinking water and munching on bread. The next moment bullets were pelting the outside walls like wind-driven rain. Salvos of dozens of RPG rockets were sailing by, hitting the telephone wires and palm trees, exploding with crumbling sounds in puffs of black smoke. The Marines were hit from the houses right next door, from adjoining courtyards and from farther down the street to the east. The insurgents hit both houses at once with a volume of fire that sounded like a radial saw, dozens of automatic weapons simultaneously tearing through magazines, the faces of the two houses peeling away in streams of gray dust, bullets pelting the cement surfaces and thwacking off at a thousand angles.[2]

Forcibly wrenching the enemy from a relaxed state to a blistering, chaotic combat situation both on a physiological and psychological level is the aim of the ambush. Few humans can move from one state to the other without missing a beat. Such mental effects can be mitigated by effective training, clear procedures, and on-the-spot leadership. In fact, achieving surprise counts for more on the battlefield than even numerical superiority. The Defence Operational Analysis Centre conducted a study of 158 land campaigns since 1914 and found that achieving surprise had the same success rate as having a 2,000:1 numerical superiority over an opponent.[3]

Perhaps the most infamous surprise attack in all of history is the Japanese attack on Pearl Harbor on 7 December 1941. Despite the fact that tensions between the United States and Japan had increased for decades and

imperial Japan had been on the war path in the Pacific for years, and there were indications and warnings that the Japanese fleet was about to make a move, it caught the U.S. Pacific Fleet completely off guard. Along with Japanese aerial attacks against the Philippines and Malaya and follow-on attacks against United States–held Wake Island and Guam, a Japanese task force attacked nine American battleships at anchorage in Pearl Harbor.[4] Although the Japanese aircraft faced an increasingly organized defense as the American forces recovered from the surprise, they succeeded in destroying or damaging 347 of the 400 American aircraft stationed on Oahu. The Japanese also damaged all eight U.S. battleships present, sinking the *Arizona* and the *Oklahoma* outright, and damaged eight cruisers and destroyers.[5] Fortunately, U.S. aircraft carriers were out at sea when the attack struck. The attack on Pearl Harbor was both a successful surprise and a tactical success; the Tet Offensive in 1968, also against American troops, is an example of a successful surprise but a tactical failure. The Tet Offensive involved strong offensives on the part of the NVA against American military positions in the north of South Vietnam, particularly at Khe Sanh, in order to draw American troops away from urban centers. The NVA attacks were followed by simultaneous attacks in the south by Viet Cong and other irregulars stiffened by NVA forces that had infiltrated South Vietnam. It is easy to see elements of maneuver in the plan: the NVA forces in the north were the *ch'i* and the NVA and Viet Cong attacks in the south were the *cheng*. The number of communist troops involved was around 600,000 and the scale of the surprise attack punctured the American narrative of success, decreasing American domestic support for the war. The Tet Offensive is an excellent example of combining physical effects in such a way as to achieve advantageous mental effects. Although the communist troops achieved no tactical objectives, or did so only temporarily, Gen. William Westmoreland himself described the Tet Offensive as a psychological victory for the North Vietnamese.[6]

While surprise appears on most lists of the principles of war, Clausewitz is unexpectedly bearish on achieving surprise, considering his reputation for believing in direct, massed attacks. After all, so much of deception and surprise rests on good intelligence, and Clausewitz was not very confident in intelligence gathering. Clausewitz viewed surprise as a spectrum: it is

easier to achieve—but its effects are also less decisive—the closer you are to the tactical level.[7] He views strategic surprise as nearly impossible but tactical surprise as rarely decisive. Still, Clausewitz's description of the effects of achieving surprise is important: "For the side that can benefit from the *psychological effects* of surprise, the worse the situation is, the better it may turn out, while the enemy *finds himself incapable of making a coherent decision*" (emphasis added).[8] This is a clear description of the mental effects the tactician attempts to cause with his physical actions and the mental paralysis he wishes to inflict on his counterpart.

9

CONFUSION

> Surprise therefore becomes the means to gain superiority, but because of its psychological effect it should also be considered as an independent element. Whenever it is achieved on a grand scale, it confuses the enemy and lowers his morale; many examples, great and small, show how this in turn multiplies the results.
>
> —Carl von Clausewitz

Confusion does not appear in the traditional principles of war. While it is a common affliction of those surprised or deceived in combat, it can occur independently and must be understood by the tactician. It also does not necessarily mean an unexpected attack. In the quote above, Clausewitz uses the word "surprise" to mean a surprise assault, which he equates not to simply another form of an attack, but rather "the desire to surprise the enemy by our plans and dispositions."[1] In other words, the tactician can use a novel, ambiguous, or unexpected arrangement of his forces that engenders confusion among the enemy. Confusion in combat is a state of mental overload or disarray that makes it difficult both to react to events and understand the situation.

To return to Clausewitz's concept of friction, he identified why military operations are so difficult: numerous little difficulties along with inherent human factors present in war cause friction within an army. Commanders must overcome this inherent friction.

Boyd saw the same dynamic from another perspective. He did not deny that every military organization has to overcome its own friction, but he also wanted to increase the friction of the opponent in order to gain an advantage or even to cause complete paralysis.

Sun Tzu is also a proponent of sowing confusion in the enemy's ranks: providing spies with misinformation, concealing plans and deployments, and so on. Operational security and information assurance are modern concepts of these ancient methods. Cyber warfare and electronic warfare are excellent means of increasing enemy friction and confusion today.

There are many ways to sow confusion in the enemy's ranks, and they are usually combined with surprise and shock. The following is a British lieutenant's description of the French and Indian ambush before Fort Duquesne in what is now Pennsylvania. George Washington was also present at this battle as a colonel:

> We had not marched above 800 yards from the River, when we were alarmed by the Indian Hollow [i.e., holloa], & in an instant, found ourselves attacked on all sides, their methods, they immediately seise a Tree, & are certain of their Aim, so that before the Genl came to our assistance, most of our advanced Party were laid sprawling on the ground. our Men unaccustomed to that way of fighting, were quite confounded, & behaved like Poltrons, nor could the examples, nor the Intreaties of their officers prevail with them, to do any one [what was ordered]. This they denied them, when we begged of them not to throw away their fire, but to follow us with fixed Bayonets, to drive them from the hill & trees, they never minded us, but threw away in the most confused manner, some in the air, others in the ground, & a great many destroyed their own Men & officers. When the General came up to our assistance, men were seized with the same Pannic, & went into as much disorder, some Part of them being 20 deep. The officers in order to remedy this, advanced into the front, & soon became the mark of the Enemy, who scarce left one, that was not killed or wounded; when we were first attacked, It was near one o'Clock, & in this Confusion did we remain till near 5 in the Evening, our Men having then thrown away their 24 Rounds

> in the manner above mentioned, & scarce an officer left to head them.[2]

Note that the panic and confusion caused by the ambush resulted in both the wasteful expenditure of ammunition and friendly fire casualties. The ambushers compounded the confusion by targeting British officers, easily identifiable as they tried to rally the confused troops. Confusion can become so overwhelming that a military forces' command and control network can be overwhelmed, which can lead to the loss of moral cohesion. (See chapter 11.) This happened in the 1971 Indo-Pakistani War that resulted in the creation of Bangladesh from what was once East Pakistan. Late during the fighting, an already reeling Pakistani command structure was further assailed by Indian army air drop in a sector where the paratroopers could prevent the linkup of retreating Pakistani forces, who had planned to mass their forces around the city of Dacca. Not only did Indian army troops drop on the actual target, but they also executed a fake drop of sixty dummy paratroopers made from cloth prior to the actual drop. The Pakistani command-and-control system was so confounded by the rapidly changing events that the air drop was reported to be Chinese even though China was not even in the war.[3]

An entire book could be written on this subject, but it will suffice here to show two modern examples of sowing confusion in the enemy at the tactical level. The classic way to confuse an opponent is to destroy or capture a command-and-control node, such as a combat operations center. In one fell swoop, the enemy loses significant communications assets and leadership personnel. At the second battle of Fallujah, the Marines knew that the Jolan District and the Maqady Mosque were such a node for the insurgent defenders so they resolved to seize this area of the city first.[4] One of the most clever and effective uses of firepower to achieve mental effects is the jumping barrage used by the Israelis in 1967. Bruce Gudmonsson describes this barrage in support of an Israeli attack on Egyptian positions:

> At first, the Israeli artillery limited itself to overwatching the silent advance of the leading waves of Israeli infantry. Once that wave was

> discovered and the Egyptians began to fire, the Israelis let loose with a "jumping barrage." That is, each tube in the Israeli "grand battery" fired at a single target. After a few minutes, all tubes switched to a second target, gave it the same treatment, and then went on to a third. At irregular intervals, the Israeli batteries would return to an "old target" in the hopes that the defenders would have left their shelter and taken up exposed firing positions. Ten minutes of this jumping barrage was enough to convince the Egyptians to keep to their shelters, whether they were being fired on or not. As a result, Israelis were able to get into the Egyptian position and root out the defenders with comparatively light casualties.[5]

The confusion caused by this jumping barrage was so overwhelming that the Egyptians ceased defending their positions. One can imagine the confusion among the Egyptian command as it tried to cope with reports of enemy artillery striking dozens of points along their line, with those dozens of reports changing every few minutes. This could overwhelm virtually any command-and-control system. It should be noted that the jumping barrage was a violation of the principle of mass as each Israeli artillery tube struck a different target. The Egyptians, used to seeing massed artillery fire, were completely confused by dispersed fire. Nonetheless, mental effects were achieved and the maneuver forces were supported.

Any organization of more than a few people needs some type of system by which its members can communicate with each other. For a military, this system is its method of command and control. Commands are issued from above, information is reported from below. The ability of a tactician to command and control forces on the battlefield is a strength, but it is also a vulnerability. Any methods that corrupt, disrupt, or overwhelm the enemy's command-and-control system and sow confusion among the opposing units, such as the Israeli jumping barrage, are as potent a weapon as surprise and deception.

10

SHOCK

Everything which the enemy least expects will succeed the best.

—Frederick the Great

Shock is a poorly defined concept in warfare, and it should not be confused with the medical term. Marine Corps doctrine says that shock is the psychological result of "speed and focus."[1] In 2001 U.S. Army doctrine associated shock with both maneuver and surprise.[2] As a psychological condition on the battlefield, the shock effect has been present since the earliest recorded military history, but the current Department of Defense dictionary does not even bother to define it.[3]

For our purposes, the shock effect is a state of psychological overload caused by the sudden, unexpected, or successive action of the enemy. There are numerous ways to cause this status, whether through bold, unexpected action or the presence of an overwhelmingly intimidating weapon, like a tank. Even the thought of enemy presence in the rear of some troops, whether real or imagined, can shock them into retreat. Shock is frequently, but not always, the result of a combination of deception, surprise, and confusion. Jim Storr has described a unit as "shocked if its effectiveness is reduced: its soldiers are not participating, but cowering in their trenches, not firing back, or perhaps running away."[4] The ability to inflict shock on an enemy is an obvious advantage.

In ancient warfare the shock effect is usually associated with the charge of heavy cavalry. In fact, the European knight of the late Middle Ages was entirely predicated on the ability of armored cavalry to break enemy troops through use of a vigorous, direct charge. And it worked. Battles could sometimes be won with a single charge until the advent of more-effective crossbows, the English longbow, pikes, and eventually firearms. These allowed the use of tactics that could withstand a cavalry charge like the Swiss square.[5]

Even after the advent of the age of gunpowder, shock remained central in tactics. Many professional militaries preferred to win engagement via the shock of a bayonet charge rather than solely through musket fire. It's not hard to imagine why: standing still in ranks while the enemy fires at you can be terrifying even if you are returning fire. A bayonet charge could end an engagement far quicker than a firefight conducted at the rate of one or two shots a minute. At the Battle of Vimeiro in Portugal in 1808, a massed French brigade in a column formation charged two battalions of British infantry and their supporting troops. The French were first devastated by artillery fire but as they approached, the British line (which was partly concealed by a low crest) wheeled around to maneuver on their left flank. The British infantry fired a single volley then charged the French column with bayonets fixed. Despite the numerical superiority and mass of the French attack, the brigade broke into a headlong retreat before the British infantry even reached them. Just the shock of the impending bayonet charge broke their cohesion. At a later battle in the Peninsular War, at the Battle of Salamanca in 1812, a British after action report describes the effect on the French of a British cheer followed by a bayonet charge: "The effect was electric; Foy's troops were seized with a panic, and as Wallace closed upon them, his men could distinctly mark their bearing. Their mustachioed faces, one and all, presented the same ghastly hue, a horrid family likeness throughout; and as they stood to receive the shock they were about to be assailed with, they wheeled to and fro like men intoxicated."[6]

The effect of shock became newly important with the development of tanks. Although the first models were slow and unwieldy, the tactics of tank warfare quickly developed to match the speed and armored firepower as the technology matured. The Germans led the developed world in terms of tank

employment and the wide-ranging thrusts of panzer divisions enabled forms of maneuver impossible in World War I. The extreme fear that the presence of tanks on the battlefield was called "tank fear" or "tank fright" and was caused by the awesome destructive power of the new weapon. Recognizing this, the German army inoculated their troops to tank fright by exposing troops to captured tanks during training. In the attack German doctrine—and especially the legendary panzer general Heinz Guderian—viewed the mental effect of tanks on the enemy as just as important as their capacity for physical destruction and their mobility.[7] The training of German shock troops of World War I was another way to inflict shock on the enemy, hence their name. Heavily armed and highly trained troops use infiltration tactics (discussed in chapter 3) to tear holes in enemy lines. Conventional troops following behind would then exploit these holes, preferably before the enemy had a chance to recover from the shock effect. Such tactics are still in use today. The terror group the Islamic State of Iraq and al-Sham (also known as ISIS) employs fighters tasked to not only hit the targets hard and fast to produce shock, but also act as suicide bombers to enhance the effect.[8]

Another way to cause shock is with a concentration of fires, or the combination of mass and firepower in the terms of our tactical system. The massive amount and power of cannon fire enabled by the Industrial Revolution allowed developed militaries in World War I to keep an enemy under fire beyond their mental capacity to endure. Ernst Jünger, a German lieutenant during World War I, describes his own experience under artillery bombardment:

> We fell out in our extended order, and lay down expectantly in a series of flattish depressions that some predecessors of ours had scooped out of the ground. Our ribald conversations were suddenly cut off by a marrow-freezing cry. Twenty yards behind us, clumps of earth whirled up out of a white cloud and smacked into the boughs. The crash echoed through the woods. Stricken eyes looked at each other, bodies pressed themselves into the ground with a humbling sensation of powerlessness to do anything else. Explosion followed explosion. Choking gases drifted through the undergrowth, smoke

obscured the treetops, trees and branches came crashing to the ground, screams. We leaped up and blindly, chased by lightnings and crushing air pressure, from tree to tree, looking for cover, skirting around giant tree trunks like frightened game. A dugout where many men had taken shelter, and which I too was running towards, took a direct hit that ripped up the planking and sent heavy timbers spinning through the air. . . .

I threw down my haversack and ran towards the trench we had come from. From all sides, wounded men were making tracks towards it from shelled woods. The trench was appalling, choked with seriously wounded and dying men. A figure stripped to the waist, with ripped-open back, leaned against a parapet. Another, with a triangular flap hanging off the back of his skull, emitted short, high-pitched screams. This was the home of the great god Pain, and for the first time I looked through a devilish chink into the depths of his realm. And fresh shells came down all the time.

I lost my head completely. Ruthlessly, I barged past everyone on my path, before finally, having fallen back a few times in my haste, climbing out of the hellish crush of the trench, to move more freely above. Like a bolting horse, I rushed through dense undergrowth, across paths and clearing, till I collapsed in a copse by the Grande Tranchée.[9]

Even Jünger's writing reflects the animal panic produced by the shock of the barrage, though the passage above was written years after the event. The physical concentration of firepower produces such mental effects. In May 2015 the terrorist group ISIS used a concentrated barrage of vehicle-borne improvised explosive devices much like a professional military would use artillery. The Iraqi city of Ramadi was struck with waves of truck bombs, some of which were powerful enough to destroy entire city blocks, that induced the defending Iraqi army units to retreat.[10] ISIS occupied Ramadi in the wake of the Iraqi army.

Finally, air and naval power can play another tremendous part in producing mental effects on the battlefield. On the islands of Roi and Namur in the Kwajalein Atoll in 1944 during World War II, U.S. Navy air

and close-in naval gunfire support dazed Japanese defenders so much that the assaulting U.S. Marines met little resistance on the beaches. At Iwo Jima in early 1945 air and naval bombardment destroyed over two-thirds of the above-ground Japanese positions (although the Japanese defense on Iwo Jima was based more on underground tunnels dug to avoid the effects of a pre-assault bombardment).[11] In 2003 Coalition forces used 1,800 aircraft to strike 20,000 targets in Iraq in support of the ground invasion. Of these 20,000 targets, 15,800 were against Iraqi army ground forces, 1,800 were against Iraqi government targets, 1,400 were against Iraqi air force targets, and 800 were against various other military installations.[12] The ground campaign was also timed to coincide with airstrikes that directly targeted Iraqi government leadership, specifically Saddam Hussein. Although the strike missed Hussein himself, the sum total of this massive air campaign was intended to cause physical destruction of targets as well as to overwhelm the Iraqi defense and decision-making systems. This aim was captured in the "shock and awe" description of the campaign. By scheduling the ground campaign to occur simultaneously, the ground troops were confronted with an Iraqi army already reeling—almost punch drunk—from the intense bombing campaign. The opening gambit of the Coalition's invasion was a meticulous combination of the full spectrum of physical and mental tactical tenets.

The culmination of these various mental effects can last long after the combat action has ended. The constant strain on the human nervous system over days or months of intermittent combat and stifling inaction can subject whole units to a mental state of dysfunction. In his memoirs of World War I, Captain Erwin Rommel describes one such unit:

> Suddenly, Bentele pointed with his arm to the right (north). Scarcely 150 yards away the grain was moving; and through it we saw the sun's reflection on bright cooking gear piled on top of the tall French packs. The enemy was withdrawing from the fire of our guns which were sweeping the highest portion of the ridge to the west from Hill 325. I estimated about a hundred Frenchman were coming straight at us in column of files. . . .

> Was I to call up the remainder of the platoon? No! They could give us better support from their present position. The penetration effect of our rifle ammunition came to mind! Two or three men at this distance! I fired quickly at the head of the column from a standing position. The column dispersed into the field; then, after a few moments, it continued the march in the same direction and in the same formation. Not a single Frenchman raised his head to locate this new enemy who had appeared so suddenly and so close to him. Now the three of us fired at the same time. Again the column disappeared for a short time, then split into several parts and hastily dispersed in a westerly direction toward the Gévimont-Bleid highway. We opened with rapid fire on the fleeing enemy. Strange to say, we had not been fired on even though we were standing upright and were plainly visible to the enemy.[13]

The mental effects of sustained combat can turn human beings into near automatons, nearly unable to fight back. In this case, a company of French troops was attacked by just three German soldiers, and declined to fight.

One of the most successful examples of using physical deployments to achieve and exploit mental effects occurred at the Battle of Mohi Bridge in 1241. A Hungarian army was facing a Mongol force under General Subedai and was actually chasing the Mongols prior to the battle. Once Subedai found a suitable spot on the Sajo River, he turned and faced the Hungarians. Subedai used a direct attack supported by a rolling barrage of catapult fire to fix the Hungarian army. Simultaneously, a Mongol detachment built a pontoon bridge elsewhere and then maneuvered against the flanks of the engaged Hungarian army. This combined attack produced panic and collapse in the Hungarian ranks, but the Mongols were not done yet: Although they could have surrounded the Hungarians, they left an escape route to their rear open.[14] When the Hungarian troops panicked, they seized on this supposed error on the part of the Mongols and fled through it. The Mongols, however, had stationed forces along the escape route; as the Hungarians flung down their weapons and retreated, these forces fell on them. The Hungarian force was annihilated. This understanding on the part of the Mongols of the mental effects that their physical deployments caused

allowed them to achieve even greater success through the exploitation of the main battle than if they had simply pushed the Hungarians back from the river.

The chapters in part II have by no means been an exhaustive list of the mental effects at play in warfare, but rather the most common in the history of military thought. Soldiers have developed thousands of tricks to play on the minds of their enemies throughout military history, from the low chanting of Spartan hoplites to the Jericho trumpets mounted on the Stuka dive bombers of the Luftwaffe. At the time of this writing Russia is periodically staging large training exercises on the Ukrainian border, using mass to both intimidate Ukraine and other regional states while simultaneously distracting international audiences from the ongoing conflict inside Ukraine. Nor is part II meant to say that mental effects are entirely predictable. Rather, it is important for the tactician to understand both the mental effects that assail his enemy and those that the enemy can use against him. Troops that are aware of and expecting this aspect of combat are inoculated against it. The tactician that can make use of his enemy's fears, cognitive biases, and preconceptions is formidable indeed, and this aspect of tactics is largely ignored by and poorly described in doctrine. Theory can provide the framework to assist the tactician in thinking about tactics in both physical and mental terms. The sum total of physical and mental effects can overcome an enemy's moral capacity to endure and fight back. It is that moral core that is the target of physical and mental means, or the wellspring with which humans in combat can overcome them. Our last realm of tactics, the moral plane, nearly defies description even though most major strategic theorists recognize its power. Despite this recognition, it is poorly understood. The moral realm can obviate both the physical and mental, so it must be considered.

11

MORAL COHESION

> In war there are the two factors—human beings and weapons. Ultimately, though, human beings are the decisive factor. Human beings! Human beings!
>
> —General Vo Nguyen Giap

In most ancient Greek city-states, the army consisted of landowning male citizens who would be called to fight during a campaign season, then would return to rural agriculture. They believed that the moral power of a man who had a stake in the state, and hence something to fight for, made for superior soldiers. Even in Sparta, the only state with a standing, professional *hoplite* army, the warriors were freemen. The Spartans allowed their slaves, called *helots,* to fight only in extremely dire circumstances. Even then, the *helots* were promised freedom as an incentive. A preference for free soldiers was unique in the ancient world at the time. Some of the soldiers of the Persian Empire, the great enemy of the Greeks, were conscripts and all of them were subjects. Such conscription and their vast empire allowed them to produce armies that were much larger than those of the Greeks. Their numbers availed them little, however, and the freemen of Greece were frequently victorious over the Persian hordes. The Persians never conquered Greece and were eventually conquered themselves by Alexander the Great leading an army of freemen.

We should not exaggerate the difference between Greek and Persian societies, however. Every Greek city at the time practiced slavery and the Persian army did include free and even professional soldiers. But in this overgeneralization is a kernel of truth: the volunteer soldier who is motivated to fight is superior to the soldier forced to fight. Even the United States has had its difficulties with conscription. The Greeks believed that the moral power of a freeman's devotion to his duty, his country, and his home was greater than the physical and mental forces arrayed against him. When working together in units, that moral power of the individual free soldier is combined into the moral cohesion of the unit. That moral cohesion, while intangible, has tangible effects on the battlefield.

Even in Roman society, where slavery was a pillar of the empire and its economy, the fighting was done by freemen (although frequently coerced into service by unscrupulous press gangs, they were not slaves). When the empire could no longer produce citizen soldiers in the numbers required, the Romans still eschewed full conscription and hired mercenaries instead. Still, the Roman reliance on mercenaries is usually blamed as a factor in Rome's fall. Mercenaries lack the moral power of citizens as their services are bought vice volunteered. The Renaissance political and military theorist Niccolò Machiavelli raged against the ubiquity of mercenaries in Italy during his lifetime, and proposed re-adopting a citizen soldier model like that of the early Romans.

Much has been written on the subject of free soldiers versus conscripts and mercenaries. This subject forms a large part of historian Victor Davis Hanson's thesis in *Carnage and Culture,* for example. What is important for the tactician is the recognition of the power of moral cohesion. The paltry three hundred Spartans at Thermopylae could not defeat the vast physical power of Xerxes' army, and they were surely affected by fear at the prospect of their own deaths. But moral forces overrode everything else.

The major strategic theorists agree on this point. In the first chapter of *The Art of War,* Sun Tzu presents five fundamental factors through which to evaluate war. The first is the moral: "By moral influence I mean that which causes people to be in harmony with their leaders, so that they will accompany them in life and unto death without fear of mortal peril."[1] Clausewitz, frequently portrayed as opposed to Sun Tzu, was just as

emphatic: “They [the principle moral elements] are: the skill of the commander, the experience and courage of the troops, and their patriotic spirit.” He even stated, “One might say that the physical [factors] seem little more than the wooden hilt, while the moral factors are the precious metal, the real weapon, the finely-honed blade.”[2] In other words, if an army is a weapon, its physical and mental aspects merely facilitate its true striking strength, its moral power. Morale, moral elements, and solidarity all contribute to cohesion, also known as esprit de corps. The moral cohesion of tactical units is the most important factor in their ability to fight and win. The French theorist Ardant du Picq, a major proponent of the power of moral cohesion, wrote, “Four brave men who do not know each other will not dare to attack a lion. Four less brave, but knowing each other well, sure of their reliability and consequently of mutual aid, will attack resolutely.”[3] There must be some moral element to fuse a group of men and women into a single unit. Of course, J. F. C. Fuller and John Boyd, whose three-part framework of physical, mental, and moral powers is used here, also agree. The moral element of conflict is so powerful that it can achieve victory entirely on its own. Mohandas Gandhi and Martin Luther King Jr. achieved political goals, in the face of a vast array of violent means on the part of their opposition, solely through the strength of moral example.

The legendary general Hannibal Barca provides us with an example of the use of moral force at the tactical level. In 218 BC, as Hannibal marched his Carthaginian and Spanish forces toward Italy from Spain, the Romans dispatched a force to stop him. The two sides met at the River Trebia in the dead of winter. The Roman consul, Tiberius Sempronius Longus, was known to be aggressive and bellicose. Knowing this, Hannibal used his cavalry force to provoke the Romans into an early-morning attack across the river. Once the Romans crossed the river and approached the main Carthaginian force, a hand-picked and concealed ambush force struck their rear. The cold, hungry, wet, and surprised Romans were routed. Hannibal used his physical deployment to mentally manipulate the Romans into depleting their own moral force by deploying early and crossing a chest-deep river in winter. When the trap was sprung, Roman cohesion collapsed.

It is this cohesion that is a physical expression of soldiers’ moral force. It is well known that soldiers in combat fight for their compatriots. The

moral force inherent in the shared risk and responsibility of military units is powerful. Additionally, with the exception of conscripts and mercenaries, some moral force induced each soldier into the ranks: whether patriotism, ideology, duty, or even vengeance.

The moral cohesion of even the most enthusiastic and loyal units can be broken if poorly handled and adroitly attacked—especially if they lose. Eighteenth-century military commentators defined soldierly courage as "bravura" and believed that it could be severely shaken by battlefield losses.[4] Whereas achieving victories enhances troop morale, defeats diminish it. Logistics also plays a part in the maintenance of morale. U.S. Marine Corps doctrine correctly states, "By displaying economy, adaptability, fairness, flexibility, and innovation, a logistics system can foster the sense that those in charge know what they are doing. In other words, good logistics reinforces the moral authority of leaders."[5] In short, when leaders take care of their troops, those troops will fight harder for their leaders. Modern military units frequently state that mission accomplishment is a unit's first priority and troop welfare is its second. This is false. Troop welfare that forges the moral cohesion of the unit—and thus its combat effectiveness—is a prerequisite to mission accomplishment. This is not to say that troops should be coddled. Challenging, realistic, and even painful training contributes to confidence and trust and thus to moral cohesion.

The morale of his troops was something that Napoleon, for example, took for granted when he ignored logistical constraints. The French Grande Armée that marched into Russia in 1812 was completely shattered by constant Russian attacks, their long retreat, the Russian winter, and starvation; this was true even after they had won the Battle of Borodino and seized Moscow. An eyewitness describes the remnants of the French army as they try to cross the Beresina River into French-controlled territory:

> Because of the horrors the crossing of the Beresina will live long in the memory of soldiers. For two days the crossing continued. Right from the beginning the troops surged over in disorder, for in the French army order had long been abandoned, and already many found a watery grave. Then, as the Russians forced back the corps of

> Victor and Dombrowski and everyone surged across the bridge in wild flight, terror and confusion reached their summit. Artillery and baggage, cavalry and infantry all wanted to get over first; the stronger threw the weaker into the water or struck him into the ground, whether he were officer or no. Many hundreds were crushed under the wheels of the cannon; many sought a little room to swim, and froze; many tried to cross the ice and were drowned. Everywhere there were cries for help, and help there was none. When at last the Russians began to fire on the bridge and both banks, the crossing was interrupted. A whole division of 7,500 men from the Victor Corps surrendered together with their general. Many thousands were drowned, as many more crushed and a mass of cannon and baggage was abandoned on the left bank. This was the end of the second period. To the Russians it brought over 20,000 prisoners, 200 cannon and immeasurable booty.[6]

The above description is a stark example of an army that had lost all cohesion due to defeats and insufficient attention to troop welfare. In *The Human Face of War,* Jim Storr described exactly what moral cohesion means to the tactician: "At what point is combat resolved? It is not when all the individual one-on-one fights are resolved. Rarely if ever is all of one side killed, incapacitated or made prisoner. On reflection we see that the normal condition for tactical success or defeat is the collective withdrawal of participation. . . . In general, defeat occurs when the enemy believes he is beaten. . . . Defeat is a psychological state."[7] Inflicting enough pain and discontent on the enemy so that his belief in his own defeat is stronger than his moral cohesion to his unit is the first goal of tactics.

Moral force is typically termed morale but it is far more than a simplistic idea of the level of troop happiness or motivation. Effective, challenging, and realistic training contributes to troop morale because it builds confidence and a sense of community within the unit. Cohesion and élan or esprit de corps is another part. It is also not strictly an ethical meaning, although ethics plays a part.

In 1921 U.S. Marine Corps Major Earl "Pete" Ellis wrote the following concerning counterinsurgency operations based on his combat experience

fighting insurgents in the Philippines: "In so far as the Marines are concerned, they believe that in every case where the United States has taken charge of a small state it has been actuated by purely altruistic motives. The layman doubtless thinks that the troops themselves give little thought to this phase, but then he does not realize that *upon this very thing the fighting morale of the individual is founded and that it forms the basis for the conduct of all military operations*" (emphasis mine).[8]

The point Ellis makes is that the strategic basis for a particular war permeates down to the lowest level, the tactical. The soldier or Marine who views his cause as just and ethical will have higher morale, and this will thus affect his enthusiasm, his discipline, and his tactical decisions. Units engaged in the pursuit of moral aims have higher moral cohesion. For tactics to appropriately serve strategy they must align with strategic imperatives, and the nature of those strategic imperatives affects the quality of tactical units. Both strategists and tacticians must understand the moral connection. Ellis recommended clear strategic guidance be provided to troops to ensure moral cohesion and morale, and to shore up ethical decision-making in combat.

The moral power available to the tactician on the battlefield is thus partly out of his control. The moral constitution of the troops available is intimately connected with the moral justification of both their presence on the battlefield and the actions they undertake. Two concepts from Just War Theory, a school of thought with origins leading back to Roman jurist and politician Marcus Tullius Cicero, are relevant: *jus ad bellum* and *jus in bello.*[9] The first, *jus ad bellum,* is translated from Latin as "right to war." This is the right to go to war for a legitimate reason, such as self-defense. Additionally, *jus in bello*—"right in war"—pertains to the justice of actions undertaken to win the war. Concepts like using proportional force and preventing the harm of non-combatants matter both to the strategist and to the tactician. Violations cause feelings of guilt and shame in the ranks, thus diminishing moral power in future battles. It is vitally important for the tactician to realize that war crimes, overly harsh tactics, or targeting civilians actually hurt his ability to succeed in battle. Beyond the practical reasons for tacticians to be concerned with these concepts and their centuries-long presence in military theory, they should be concerned

because they are enshrined in international law. The illegality of weapons such as chemical and biological agents is a tangible result of theory and ethics.

The connection between the ethics of the war's purpose and the permutation of that morality through strategy down to the tactics was forgotten by a later generation of Americans. Jim Frederick, author of the book *Black Hearts: One Platoon's Descent into Madness in Iraq's Triangle of Death,* blamed the war crimes committed by the platoon in part on incoherent strategy: "To some degree, the travails of Bravo Company are a study of the tactical consequences that flowed from flawed strategy. . . . There was no coherent strategy for how they were supposed to accomplish these feats [fighting the insurgents]. There was confusion about whether they should emphasize hunting and killing insurgents or winning the support of the people who were providing both passive and active assistance to the terrorists. This confusion flowed from the Pentagon, through the battalion's chain of command, all the way down to the soldiers."[10] Strategic confusion produced low morale that in turn contributed to the unit committing war crimes. It is both a moral and tactical imperative for the tactician to prevent such events.

Effectiveness at the moral level of tactics thus begins with effective, ethical, and coherent strategy. Poor policymaking and muddled strategic thinking at the highest levels directly affect the well-being of the troops at the lowest levels and their ability to accomplish their assigned missions. Maintenance of the morale of troops is a long-term prospect and moral fortitude must be cultivated at every level, from corporal to commander-in-chief. Again, we see how strategy permeates tactics: troops engaged in an ethical struggle for a righteous political goal will be inherently stronger on the moral sphere. Of course, morality can be relative. The troops must at least believe they are fighting for a moral purpose. Confederate and Wehrmacht soldiers, for example, fought tooth and nail for vile causes. While many of them were surely committed, still others were misled by their leaders and focused on the defense of their homelands from perceived aggression. Moral cohesion is not entirely dependent on the morality of the cause.

Another aspect of the moral element is leadership. In the words of strategic theorist Colin S. Gray, "For morale to be high [and thus moral power enhanced], every level of the military hierarchy needs to be able to trust the personal integrity and the professional competence of the levels above it."[11] It seems patently obvious that soldiers will fight harder and longer, and thus better, for leaders they trust and respect. It follows that we should select leaders based on their ability to establish this relationship with those they lead. If that senior leader fails in this key task by losing the trust and respect of his subordinates, those subordinates will consequently underperform. Yet those punished for the senior leader's failure—through promotions delayed or denied—are those subordinate leaders he assesses.

History is replete with examples of the inspired and inspiring leadership snatching victory from defeat by enhancing the morale of troops. During most of the Hundred Years' War, the English were initially dominant when facing French troops, so much so that the French king, Charles VI, was forced to promise his crown to King Henry V of England after his crushing victory at Agincourt in 1415.[12] The peace, however, did not last and the war resumed. In 1429 the French city of Orléans was besieged by English troops and the French were unable to relieve it, until a young woman known as Joan of Arc appeared. Joan was a seventeen-year-old peasant who believed she was sent by God to win the war for France. She convinced the French to allow her to lead an attack on the English. After personally leading an attack on the English lines, Joan punched a hole through to the city and then, in further fighting and despite being wounded, forced the English to lift the siege. The French troops had been demoralized after decades of failure against the English but the moral example of one girl reinvigorated the French armies, who then began rolling back English positions. The English king Henry VI was only seven years old in 1429 and thus England was in no position to recover the initiative. Joan's actions at Orléans prevented a united English and French monarchy forever. It is a testament to her military leadership and effectiveness that when English allies captured her, the English burned her at the stake. That a young woman could lead veteran armies, tip the scales of a war, and become such a threat to England solely with inspirational leadership demonstrates the power of moral example. The idea that Joan of Arc innately understood

tactics or was receiving instructions from a deity is preposterous. But the French troops believed fervently that she did, and that belief contributed to create moral power that they had lacked.

One of the best examples of the moral power of leadership is Mustafa Kemal at the battle of Gallipoli in 1915. The future Atatürk, father of modern Turkey, was present at the battle on the Turkish side as a heretofore undistinguished officer. On 6 August 1915 the British landed additional troops on the Gallipoli peninsula, opening another front in the already three-month-old battle. The landing was timed to coincide with an offensive from the troops that had already established a beachhead on the peninsula. Despite the fact that the British offensives throughout the peninsula were desultory and lacked aggression, the Turkish lines strained at the new pressure and many key positions fell to British and especially Australian units. The top German army advisor to the Turks, General Liman von Sanders (the Germans and the Turks were allied and Sanders was more in command than he was an advisor) urged the Turks to counterattack for three days. Finally, on the night of 9/10 August, he relieved the Turkish commander and put Mustafa Kemal, then a division commander, in charge of the entire Turkish defense.

Mustafa Kemal was informed of his promotion at about 11:00 p.m. By 4:00 a.m. he had reorganized the Turkish defense and given orders for a counterattack. The attack began at 4:30 a.m., and by 6:00 a.m. the British were retreating, their attack in disarray. Kemal stayed awake through 10 August, leading many Turkish attacks and reconnaissance missions personally. By the time he was done, the last British chance to turn the battle into a victory had been defeated.[13]

Gallipoli did not have to be a victory for Turkey. On the night of 9/10 August the Turkish lines were on the point of complete collapse. Although the British, Australian, and New Zealand troops involved on the other side were poorly led, they were extremely tough fighters and could have at least held on to their gains—if not gained even more—if things had been different. The division- and corps-level leadership on both sides was composed of very conservative and passive generals. The British commander-in-chief, General Ian Hamilton, was not even on the battlefield. He remained on a Royal Navy battleship off shore. Although Mustafa

Kemal was not yet distinguished when he was given command, he was known to be aggressive and thus was an inspired choice on the part of Sanders. On the night of 9/10 August the Gallipoli peninsula and perhaps Turkey itself was up for grabs. All things being equal—equally chaotic and disorganized in the case of Gallipoli—leadership tipped the scales. Inspirational leadership at bayonet range can change the fate of nations.

The advancement of technology has done nothing to diminish the importance of moral power in combat, which is more evidence that there is an underlying and timeless aspect to tactics. In 2014 the Iraqi army—which had just enjoyed a decade of training by the United States and its allies—was routed by a much smaller and much less well-equipped force of terrorists calling themselves the Islamic State in Iraq and al-Sham (now known as ISIS). Prior to the attack, the group executed a months-long campaign against Iraqi army leaders near Mosul that were considered to be the most loyal and stalwart in the army.[14] ISIS fighters assassinated dozens and demolished some Iraqi troops' homes while they were away. This sustained campaign of terror completely undermined the moral cohesion of the Iraqi army. When the formal military attack on Mosul took place, the Iraqi army shattered and fled.

The moral element in warfare, then, is a combination of morale, cohesion, ethics and morality, and leadership. Combined, it can be termed "moral cohesion." It is an intangible presence, but a presence nonetheless; it defies codification. The important part for the tactician is simply the recognition of the moral forces at play in battle and their potential to trump physical and mental forces. At the same time, there are limits. Enough men and metal will overwhelm even the most dedicated fighters, as happened when the Romans besieged the fortress at Masada in AD 73 and 74. The besieged Jewish rebels eventually chose suicide rather than submitting to the Romans. Moral factors can sustain troops far beyond the normal physical and mental limits of human beings, provided they perceive their cause as a righteous moral imperative worthy of their lives. The tactician must account for the moral trump card when evaluating his hand. Although physical deployments and clever mental manipulations can raise the probability of victory, they can never provide a guarantee and moral force can always show its face. As Clausewitz said, "Battle is the bloodiest

solution. . . .—its effect . . . is rather a killing of the enemy's spirit than of his men."[15]

PART II

TACTICAL CONCEPTS

The tactician does not fight in an antiseptic laboratory. There are contextual realities with which he must always contend but that he can also exploit.

He is also not a warrior who must be concerned solely with his own weapons and methods and those of his enemy. The tactician is always the head of an organization, be it only a fire team. Only in rare cases is he not also a subordinate to another tactician above him. The idea of Achilles facing Hector on the fields before Troy is simply a story. It is not a reflection of actual combat between nations, armies, and fleets. Part II is a discussion of the most important concepts that are realities of the tactical context.

The first is the Clausewitzian concept of the culminating point of victory and its primary driver, friction. War is a human endeavor and humans cannot be expected to fight forever. The tactician ignores the limits of his troops at his peril, for the clever tactician will exploit it.

The second is a combination of three original principles of war: offense, defense, and initiative. These three concepts are too interconnected to be separated but they are too important to be dropped from the theory expressed here. Therefore, they are discussed together as vital aspects of the tactical context given that they are frequently determined more by strategy than by tactics.

Third, since the tactician is never alone as was Achilles and must in all situations work as part of an organization, command and control must be discussed. The dynamics of command and control across military history are outside the scope of this work but history does teach a number of concepts that are proven effective and that the tactician must understand.

Finally, every tactician contends with the environmental factors of the Earth itself. Both geography and weather will affect his deployments and tactical decisions, but they will also offer him opportunities. To understand the environment and the weather is to be able to recognize both detriments and benefits in the tactician's surroundings.

12

THE CULMINATING POINT OF VICTORY

> It is easier to find men who will volunteer to die, than to find those who are willing to endure pain with patience.
>
> —Julius Caesar

The culminating point of victory is a vital concept for both the tactician and the strategist. The dynamics are much the same at both levels: as a military force achieves victories it expends potential combat power. Soldiers are fatigued, stocks of ammunition are depleted, nerves are frayed, and fuel has been burned. This effect is much more potent on offensive operations than it is on defensive ones.

In terms of the tactical system developed here, the moral power of military forces at some point begins to ebb. The thrill of victory can boost morale to a high degree; every soldier likes to win and survive. But at some point the spirit must rest, especially if casualties are heavy. Tired staffs and leaders lose some mental acuity that is sorely needed both to outthink the enemy and to coordinate various friendly capabilities. Physical deployments and maneuvers are executed less aggressively by worn-out, and sometimes wounded, troops. Eventually, friction always overcomes momentum.

Like so many concepts, this one comes from Clausewitz. In *On War* he describes a feedback loop between tactical victories and the morale—and

thus combat power—of troops in the field. He wrote, “This superiority is certainly augmented by victory.”[1] In all cases though, the negatives eventually prevail. An assaulting force cannot continually attack due to a myriad of physical and psychological forces. The point where all of these factors converge is the culminating point of victory. For Clausewitz, it was the point where the offense becomes the defense. It was also the natural goal of planning: the staff should estimate where the culminating point of victory should occur and make it a planned event, rather than allowing it to surprise the force. The reason for this is that the culminating point of victory is also a point of vulnerability. If an enemy counterattack occurs just when the force is overdrawn, the hard-won gains can be easily erased.

Infantry units in the U.S. military train for just such a vulnerability. After conducting an assault in training, the attacking unit immediately forms a 180: a defensive semicircle formation oriented on the enemy’s most likely avenue of approach. After an assault, troops are tired, out of breath, possibly wounded, and coming down from a rush of adrenaline. It is the most opportune time for an enemy counterattack. Infantry leaders realize this, and thus take a strong defensive position until their troops recover from the high of combat.

This culminating point is a function primarily of human factors. An adroit and responsive logistics system can keep the troops supplied with food, water, bullets, and fuel, but it can only do so much for weary muscles and frayed nerves. The effects of human factors can be mitigated by hard, realistic training, but can never be eliminated.

There are numerous examples of this dynamic in military history. One of the best is the Battle of the Bulge in 1944. By December of that year, the Allies had succeeded in injecting superior combat power into Western Europe and had pushed the Wehrmacht back from the Normandy beachhead. But at this point, supply lines were stretched and Allied commanders, riding a wave of success six months long, began to relax. This is when Hitler struck.

The Wehrmacht had created two new armies consisting of thirty divisions and concentrated them along with stockpiles of fuel on the western front. Using this mass, the Germans launched Operation Autumn Mist, a powerful thrust through the Ardennes Forest aimed at seizing

Antwerp and splitting the Allied line in two. The attack achieved "absolute tactical and strategic surprise" along a forty-mile front and sent some American units into a headlong retreat.[2] The attack was timed to coincide with heavy fog so that the Allies' advantage in air superiority was negated. With impeccable timing, or great luck, the Germans had caught the Allies at their most lackadaisical. The Allied high command was convinced that Germany was already beaten, and only General Patton realized the mistake before the Germans made their move.[3]

Although the Germans had caught the Allies at their culminating point, the Germans reached their own far too early. Newly created infantry units were filled with hastily trained and inexperienced conscripts. These green units could not effectively hold the territory gained by the leading panzer units. On 22 December the fog cleared and Allied air units hammered the German formations from the skies. Despite the prestaged fuel reserves, panzer units still ran out of fuel, just when they needed it to escape the Allied aerial counterattack.[4] These factors and the tenacious defense of many American units such as the 101st Airborne Division caused the Germans to culminate well short of Antwerp. Additional Allied attacks, notably by Patton's Third Army, erased German gains.

Despite today's high technological warfare, the culminating point of victory still must be reckoned with. Today's Marine Corps doctrine states, "We advance at a cost—lives, fuel, ammunition, physical and sometimes moral strength—and so the attack becomes weaker over time. Eventually, the superiority that allowed us to attack and force our enemy to defend in the first place dissipates and the balance tips in favor of the enemy."[5]

The effects of the culminating point of victory are obvious even today. The terrorist group called ISIS burst on the scene in 2014 with a blinding series of successes against rebel groups in Syria and the Iraqi army in western and northern Iraq. Inevitably, ISIS was halted by local Iraqi forces and U.S. airstrikes. In 2015 the Iraqi army began striking back and taking territory from ISIS, including the city of Tikri. Immediately thereafter, however, the battered Iraqi army culminated again and ISIS began advancing once more in Iraq and Syria. In late 2015 the Iraqi army recovered and, as of the time of this writing, had succeeded in retaking

Ramadi. The pendulum of victory and culmination is swinging rapidly in this conflict.

From Clausewitz down to modern doctrine, the culminating point of victory has been associated with the offense. But the same factors that limit the potential of an attack also plague troops stationed in a defensive posture, albeit at a much slower rate. Culmination is thus a key component of our next concepts: the offense, the defense, and the initiative.

13

THE OFFENSE, THE DEFENSE, AND THE INITIATIVE

It is more agreeable to have the power to give than to receive.

—Sir Winston Churchill

The need to discuss the dynamics of offense and the defense is obvious. Almost all military actions can be categorized as one or the other or both. For example, the French spoiling attack on Braddock's column at the Battle of the Monongahela in 1755 was an offensive maneuver undertaken to defend Fort Duquesne, Braddock's intended target. What is not quite so obvious is the inclusion of the initiative. The initiative is a frequent occupant on lists of the principles of war but it is almost always seen as associated with or a function of the offense. This is frequently the case, but it is by no means always so. The initiative is defined in Marine Corps doctrine as "offensive operations seek to gain the initiative, and exploit the initiative, causing the enemy to react."[1] This betrays a misunderstanding of both offense and initiative.

Still, this mistake is understandable. The Marine Corps borrows many ideas from Clausewitz who on this subject states, "Defense has a passive purpose: *preservation;* and attack a positing one: *conquest*" (emphasis in original).[2] The defense is a necessary method that functions to both retain certain positions and to allow forces to rest and rearm after, or in

preparation for, an offensive attack. It is that offensive attack, however, that achieves victory or gains some asset.

The defense is necessary not only to rest and refit troops but also because it is inherently the stronger form of warfare, another Clausewitzian idea. The defender can choose favorable ground on which to build his defense and build entrenchments to make the position even stronger. While the attacker must expend energy and resources to find the defender, the troops in the defense rest and refit. Upon reaching the defense, the attacker has only limited options for his offensive maneuvers and, barring incompetence on the part of the defenders, will incur casualties just to approach the defensive position. It is actually the defender in some situations who has the initiative. In the words of the Prussian himself, "Time which is allowed to pass unused [by the attacker] accumulates to the credit of the defender. He reaps what he does not sow."[3]

But the defense can achieve nothing: it can only preserve what has already been gained. Although the offense is riskier, a military force must assume that risk in order to gain tactical victories, whether it is possession of key ground, destruction of enemy troops, or any other tactical task. There are other benefits to the offense besides these accomplishments: motivated troops want to attack, and moral benefits follow victories, for a time. The effects of a successful attack reverberate back to the domestic population: the perception of successful warfighting can increase approval for a war.

Despite his pronouncement that the defense is stronger, Clausewitz clearly favored the offense: "Whenever boldness encounters timidity, it is likely to be the winner." He believed that the defense should be used only when necessary. For example, upon reaching the culminating point of victory; a point which is "tied to mental effects." Additionally, a good defense will employ offensive elements: "So the defensive form of war is not a simple shield, but a shield made up of well-directed blows." Troops in a defensive posture should employ aggressive patrols and limited attacks to keep an offensive enemy at bay and to create opportunities to transition to the offense through the use of a counterattack, or the "flashing sword of vengeance."[4]

Current U.S. Army doctrine reflects the above theories to a great degree. The Army defines offensive operations as "Combat operations conducted to

defeat and destroy enemy forces and seize terrain, resources, and population centers. They impose the commander's will on the enemy." Aspects of the offense include "audacity, concentration, surprise, and rapid tempo." Defensive operations are described thusly, "Their purpose is to create conditions for a counteroffensive that allows Army forces to regain the initiative."[5] Its characteristics are "disruption, flexibility, maneuver, mass and concentration, operations in depth, preparation, and security." The reader should recognize a jumbled group of terms used in this work and others that are not defined. One wonders what the difference is between "concentration" in the offensive section and "mass and concentration" in the defensive section; they are synonymous in the way they are used. This kind of doctrinal confusion is one of the reasons for this book and this chapter is meant to clarify the same concepts.

What is already clear is that while the Army and the Marine Corps maintain an appropriate bias for the offense, confusion remains about their interaction with the initiative. The best illustration of the dynamics surrounding these three concepts is the Battle of Fredericksburg in 1862.

In the winter of 1862 Gen. George B. McClellan—who lacked any semblance of a bias for the offensive—was finally fired by President Abraham Lincoln for his inability to fight and defeat the Confederate Army of Virginia, led by Gen. Robert E. Lee. McClellan had always enjoyed a healthy numerical superiority over Lee but had failed to take advantage of it. Lincoln wanted an attack based on his own excellent military judgment and the pressure of Republicans in Congress. On 7 November 1862 Gen. Ambrose Burnside was given command of the Army of the Potomac.[6] Upon his assumption of command, Union secretary of war Edwin M. Stanton demanded Burnside's plan, "immediately."[7] The pressure on Burnside to assume the offensive, therefore, was immense—and Lee knew it.

But the question of where Burnside would attack was an easy one for Lee to resolve. In order for Burnside to supply his troops in hostile country he needed to use a railroad. He could use either the Orange and Alexandria Railroad from Manassas to Culpeper, where Lee was stationed, or the Richmond, Fredericksburg and Potomac Railroad through Fredericksburg.[8]

Although Lincoln favored the route through Culpeper, Burnside chose Fredericksburg since it would get him closer to Richmond.

Although Lee had few forces at Fredericksburg in November, Burnside telegraphed the move for a month and his movements were stymied by logistical delays surrounding the transportation of pontoon bridges necessary to cross the Rappahannock River. A Union division under Maj. Gen. Edwin Sumner arrived at Fredericksburg in mid-November when the town itself was held by no more than a token force of Confederate troops. To his credit, Sumner requested to cross the river and establish a beachhead but Burnside refused to allow it.[9] Burnside's lack of boldness in the offense thus threw away what initiative he had left and let Lee know exactly where the intended crossing would occur nearly a month before the battle. Additionally, Burnside believed that, rather than crossing the river above or below the town itself, Lee would be more surprised by an assault through the unfavorable urban terrain of a town loyal to the Confederacy and ringed by heights that were perfect for the defense. In the words of historian James McPherson, "Lee was surprised only by the folly of this move."[10]

The delays allowed Lee to station a corps under James Longstreet around the town and then reinforce it with a corps under Thomas "Stonewall" Jackson transferred from his original position west of Washington, DC. The Confederate troops had plenty of time to fortify and prepare their defenses. One artillery officer under Longstreet remarked on the open fields in front of the Confederate lines, "A chicken could not live on that field when we open on it."[11]

On 11 December, in frigid weather, Burnside's troops laid down the pontoons and crossed the Rappahannock directly into downtown Fredericksburg. Confederate skirmishers and snipers plagued the crossing; despite an artillery bombardment of the town (fortunately evacuated of civilians), Union troops had to fight their way through stout brick buildings of the town. This was not the main Confederate defense however. Lee knew well the need for an offensive aspect to his defense.

Once through the town, Burnside's plan was to outflank the Confederates on their weaker right flank while a frontal assault on their stronger left flank fixed the Confederate line in place. But while the Confederate right was weaker, it was by no means weak. Since the Union

forces were bottled up in the low ground around the town by the Confederate defenses, Burnside was too restricted to use his advantage in mass. The Union troops could only attack in piecemeal fashion vice simultaneously. Despite these disadvantages, Union troops still succeeded in breaking the Confederate line on the right flank on 13 December, but a quick counterattack pushed the Union forces back.[12]

The actions of both Lee and Burnside amply demonstrate the concepts of offense, defense, and the initiative. Burnside had little initiative from the start—not only because of poor tactics but mostly because of strategic-level pressure that required him to attack as soon as possible. This aspect is also a lesson in the primacy of strategy and how it can affect the tactical plan. Burnside had to fight, and this allowed Lee to predict his moves and choose where to defend. Lee was thus able to use the defense—the stronger form of war—and that defense was enhanced by his ability to utilize the initiative and choose the location carefully. Contra current U.S. military doctrine, the initiative is not exclusive to the offense. Sometimes the initiative is determined by the commander's actions but sometimes by the dictates of strategy. Lee's successful defense even had strategic effects: Burnside offered to retire (he was initially refused but by the end of January Lincoln accepted his resignation) and further Union offensives would not occur for months.

Finally, the tactician must not only take into account the tactical offense and defense but also the strategic offense and defense. This is because taking the offense on one level does not necessarily mean you must at the other. You can be strategically defensive but tactically offensive, for example. The Norman Invasion of England in 1066 is a useful illustration of the dynamics between strategic and tactical modes of warfare.

In the late summer of 1066 William the Conqueror, then a duke of Normandy in the north of what is now France, launched an amphibious invasion of England to assert his claim to the throne. This placed him on the strategic offense and the reigning king of England, Harold II, on the strategic defense. Upon arriving in southern England, however, William began to ravage the countryside to both supply his men and to draw Harold south to fight. Thus William assumed the tactical defense while forcing Harold to take the tactical offense to protect his subjects. Harold did so, but

intended to use surprise to catch William off guard with a rapid advance. When William learned of this, he turned the tactical tables again and advanced to meet Harold before he was ready. William was now both on the strategic and tactical offense while Harold was on the defense at both levels. Harold accepted this and seized a ridge near Hastings on 14 October to await William's attack. Despite William's impressive command and manipulation of the offense and defense at both the tactical and strategic levels, the battle could have gone either way. After hours of brutal combat, the battle was finally decided by Harold's death in combat, and William seized the throne.[13] To return to the Battle of Fredericksburg, Lee was both on the strategic and the tactical defense while Burnside was on the strategic and tactical offense. Despite this, Lee still integrated an offensive aspect to his defensive plans.

One last example will suffice to further illuminate the concept of the initiative. On 19 June 1944 in the Philippine Sea, an imperial Japanese fleet attacked a U.S. Navy fleet under Adm. Raymond A. Spruance. Although Spruance was aware of the presence of the Japanese, he declined to attack first, violating classical views of the initiative. He did this for two reasons: First, his mission was to protect the U.S. Marine landings on the island of Saipan and second, he had a shrewd assessment of his own and the Japanese capabilities. In order to attack the Japanese first, Spruance would have to devote some portion of his fighter aircraft to escort the bombers, thus weakening his defense since those aircraft could not interdict the Japanese bombers. The Japanese had 9 aircraft carriers and 450 aircraft, whereas Spruance had 15 carriers and 704 aircraft.[14] The Japanese aircraft attempted to attack the American carriers and instead flew into a buzz saw of antiaircraft fighters and were decimated. Only thirty-four Japanese aircraft survived and no American ships were sunk. Then, Spruance authorized a counterattack that sank one Japanese carrier and heavily damaged another. American submarines sank another two enemy carriers. Spruance received heavy criticism for declining to attack first but the results speak for themselves. He understood when attacking first was to his advantage, and when it was not.

We again see the need for the tactician to be aware of the demands of strategy even while developing tactical plans. A tactical plan cannot be

considered good if it does not serve the strategy, even if the tactical engagement is won. The dynamics of the offense and the defense and the more nebulous concept of the initiative, which can shift at a moment's notice based on the circumstances, is one of the most important contextual concepts for the tactician to master.

14

COMMAND AND CONTROL

> Generally, management of many is the same as management of few. It is a matter of organization.
>
> —Sun Tzu

Just as important as the tactical tenets is how forces are organized to fight. A tactical force that is not able to effectively act and react to the fluid chaos of combat will be overcome by the force that can. Because of that fluidity and chaos, the most effective military forces are those where subordinate leaders are empowered to make decisions without waiting for orders from above, but who are still responsive to such orders when they do come.

In order for subordinate commanders to be able to make effective decisions, they must be primed with information regarding the larger context of the battle in which they are engaged. This method of command and control is called *Aufragstaktik* in German and mission command in English. This method rests on three pillars: commander's intent, the main effort, and the reserve. The concept itself is essentially a combination of the best practices of centralized and decentralized command.

The legendary German general Helmuth von Moltke said that no plan survives first contact. He was undoubtedly correct. No matter how detailed the plan or how accurate the intelligence on which it is based, the situation will change immediately upon confronting a thinking, reacting enemy force.

Both the fast pace of combat and the inherent play of chance contribute to this fact. Such a state can only be mitigated by leaders empowered to react to events as they happen. This allows a military force to be not only more flexible, but also more responsive and thus faster than its opponent. Moltke himself introduced the concept into the Prussian military and believed, "The advantage which a commander thinks he can attain through continued personal intervention is largely illusory. By engaging in it he assumes a task which really belongs to others, whose effectiveness he thus destroys. He also multiplies his own tasks to a point where he can no longer fulfil the whole of them."[1] It takes a skilled military force to operate in this manner, but the trend has been obvious for centuries. As Paddy Griffith, war studies lecturer at the Royal Military Academy at Sandhurst has written, "Looser formations and heavier fire preparations had to be used in the bayonet charge, while those responsible for training were ever on the lookout for better ways to stiffen the initiative and resolve of their men. In the twentieth century a similar process has steadily continued. Formations have become looser still, and the battlefield has become even emptier. As a result personal initiative has loomed ever larger as an essential military virtue which it is the task of training to develop."[2]

Moltke is thus undoubtedly correct, and as warfare becomes more fluid and formations more dispersed in correlation with the increased amount of firepower that militaries and soldiers are able to bring to bear, decentralized command and control becomes ever more important.

But few armies are willing to operate while allowing such freedom to subordinate commanders. Centralized command styles are far more common than decentralized. The reasons for this are clear: the senior commander is usually the most experienced and presumably the most talented commander in the organization. But still there is a debate between centralized and decentralized command. There are, of course, advantages and disadvantages to each. The advantage of centralized command is that it gives one commander tighter control over the actions of his subordinate units. Additionally, it easily ensures that every unit is working in unison toward one goal. The problem is that one commander cannot be everywhere at once, or even in two places at once. Inevitably, his focus will be in the

wrong place at the wrong time, forcing subordinate units to wait and miss opportunities or even be destroyed in place by enemy action.

The advantages of decentralized command have already been mentioned, but to reap these benefits the commander must sacrifice some measure of control and unity and must trust the abilities of his subordinates. This is a worrisome prospect for any commander, but he can ensure that subordinates make good decisions by informing them about the mission to be accomplished and organizing his forces to foster flexibility and faster tempo. This also requires a great deal of education and training to ensure that troops know where and when to make an attack even in the absence of orders: recall the description of the Prussian swarming tactics of 1866 from chapter 3.

Aufragstaktik was typified by the command style of Erwin Rommel. Rommel "sought as well to develop a common way of doing things—not as a straightjacket, but rather as a framework for structuring the behavior of subordinates in the constant emergency that was the modern mobile battlefield. . . . Rommel made clear to his senior staff officers that he depended essentially on them to process and evaluate information in his absence, and to act on it, should that seem necessary."[3] The post–World War II American military, most especially the Marine Corps, seized on this German style of command. Mission command also ensures that if your force is attacked, it will react immediately whether or not the commander is able to formulate a plan. Sun Tzu describes something similar: "Now the troops of those adept in war are used like the 'Simultaneously Responding' snake of Mount Ch'ang. When struck on the head its tail attacks; when struck on the tail, its head attacks, when struck in the centre both head and tail attack."[4] Decentralized command and control ensures the enemy cannot attack one part of the force without having to deal with another.

The structure of mission command is provided by the commander's intent, or end state. Modern military orders are massive, detailed tomes, but the beating heart is the commander's intent paragraph where the commander explains what he wants to achieve. Even if random chance and changing circumstance renders the entire order and the mission statement irrelevant—a not improbable occurrence—clear commander's intent gives subordinates the necessary information to make their own decisions.

Additionally, the commander's intent fosters unity by giving subordinates a common picture and common idea about their role within it, synchronizing their efforts without the need for overly restrictive centralized control. This is accomplished through a commander's intent that is established at every level of command—ideally from the president (or whatever national authority) down to the infantryman.

The freedom offered to the subordinate that drives flexibility and tempo is achieved by utilizing mission-type orders. A mission-type order tells a subordinate commander what to do, but not how to do it. The order tells them, for example, "Seize Hill 382." Then, the recipient of the order decides how to seize Hill 382, whether through maneuver or mass or any other combination. The subordinate chooses from a variety of options based on doctrine, training, and experience, which is one reason why a common theory of tactics is so vital to modern warfare. In a 2012 white paper on mission command, Gen. Martin Dempsey, then chairman of the Joint Chiefs of Staff wrote, "[The Joint Force] will, by necessity, act by the guiding star of intent. Mission-type orders will be the norm. Commanders will be required to understand intent to the level of effect; that is, strategic to tactical and across domains. They will be required to clearly translate their intent (and that of higher) to their subordinates and trust them to perform with responsible initiative in complex, fast-changing, chaotic circumstances."[5] This is an apt and succinct description of mission command. Importantly, those leaders that must act in such a capacity must be well trained and highly educated in an environment that supports individual initiative.

Perhaps the best example of this concept occurred well before the Germans even codified it. On the second day of the battle of Gettysburg in 1863, Union troops held the high ground south of the town of Gettysburg and had beaten back strong Confederate attacks all day. The last attack was aimed at an undefended point on the Union left that, if it had succeeded, would have allowed the Confederate troops to outflank the Union line and attack them from the rear. Just in time, the Union chief of engineers Gen. Gouverneur K. Warren, acting on his own initiative sent a brigade to oppose it. The attack hit the left-most regiment of that brigade—the 20th Maine under Col. Joshua L. Chamberlain, a former professor of rhetoric. The 20th

Maine fended off repeated Confederate assaults before it ran out of ammunition. Chamberlain then ordered a bayonet charge that scattered the Confederates and saved the Union line. The Confederates tried to break the line again the next day but failed. Their best chance to win a victory on Northern soil was defeated without the Union commander, Gen. George Meade, even having to give an order to do so.

Another key aspect of mission command is the concept of designating a main effort, or in German the *Schwerpunkt.* The commander designates a subordinate unit as the main effort and other units as supporting efforts. For example, a regimental commander would designate one battalion as a main effort and the other two as supporting efforts. This provides a guiding framework to the three battalion commanders who can then make decisions on the spot that support the main effort. The choice of unit designated as the main effort is tied to the mission; the main effort unit is usually the commander's bid for success (the unit whose actions will win the battle.)

Put in terms of the tactical system developed here, a unit assigned to apply firepower to the direct front of an enemy unit in order to fix it in place would be a supporting effort. The main effort would be the unit assigned to maneuver to the enemy units' flank and attack it from the rear. The concept is similar to Sun Tzu's *cheng* and *ch'i,* or ordinary/extraordinary concept, although for Sun Tzu the supporting effort (*cheng*) is always a way to fix the enemy's attention and the main effort (*ch'i*) is always the striking force.[6]

Since combat is unpredictable, the main effort can be changed in stride. If the flanking force becomes bogged down as it moves, the higher commander could designate the fixing force as the new main effort. This signals to the subordinate commander that he must now attack the enemy force while supporting arms units know to divert resources to support the new main effort. The main effort is usually weighted with reinforcements or designated support to give it the punch needed to decide the battle. In the words of William Lind, author of the *Maneuver Warfare Handbook,* "The Schwerpunkt can also be understood as the harmonizing element or medium through which the contracts of the intent and the mission are realized. It pulls together the efforts of all subordinates and guides them toward the goal, toward the result their commander wants."[7] If a supporting

commander finds that his mission has become irrelevant because of changing circumstances, he can make a decision based on how he can best support the main effort.

Of course, the main effort should be aimed at a decisive point, an aspect of the situation that will bring about victory. At the Battle of Leuctra in Greece in 371 BC, the Theban general Epaminondas knew that to beat his enemies he had to first beat the Spartans, the most highly skilled warriors in Greece. Epaminondas used mass to create a main effort within his phalanx. At the time, Greek hoplites fought each other in ranks twelve deep, even the Spartans. The Spartans were dominant as long as this tradition was followed because their greater training paid off against equal numbers of part-time hoplites employed by other city-states. Epaminondas, knowing that his troops could not beat the Spartans on equal terms, organized his left wing into a phalanx ranks fifty deep. Despite their greater skill, the Spartans were overcome and suffered heavy casualties. When their allies saw the Spartans retreat, the entire line collapsed. By using mass to give his main effort weight and then developing a tactical scheme to take advantage of it, Epaminondas attained a victory over the vaunted Spartans.

The last aspect of command and control is the designation of a reserve force. A reserve is simply a portion of friendly forces stationed in such a way that they are out of the thickest fighting but able to quickly act if necessary. Typically, the reserve force is prepared to either react to an unforeseen enemy maneuver or to exploit the success of the main effort at a critical time, thus continuing the attack with fresh troops. The reserve, unlike other units, should be committed only on the order of the overall commander. The use of the reserve then offers the commander an advantage of centralized control while providing both flexibility and a hedge against the unforeseen and the culminating point of victory. A reserve force should be heavy enough to make an impact on the enemy but fast enough to react quickly. Cavalry and tank units are ideal in this capacity.

In his book *Military Power: Explaining Victory and Defeat in Modern Battle,* Stephen Biddle convincingly posits that the manner in which a military force is employed is a far better determinate of success than whether it has numerical or technological advantages. Effective employment of military force flows from appropriate organization. The concepts discussed here are battle-tested practices that preserve a

commander's ability to affect the battle while fostering the necessary flexibility, tempo, and rapid decision-making necessary to succeed in battle. Brought together and executed by troops trained and educated enough to employ them, they are necessary methods to execute modern tactics.

There is one more vital aspect of using mission command, and it is a limitation. Unfortunately, another timeless aspect of war and warfare is the brutality and callousness that it engenders in human beings. Savagery is unavoidable because warfare rends the fabric of societies and distorts the bonds between and among individuals. The actions of soldiers must be limited by clear and enforced rules of engagement. When making decisions, subordinate commanders must know what is unacceptable under any circumstances, even to attain victory. This is a strategic level function that can never guarantee the absence of war crimes, but it is a necessary control on the actions of troops. Again, it is the tactician who must recognize when an action will hurt the strategy or the long-term emotional health of his troops and prevent such events.

15

ENVIRONMENT AND GEOGRAPHY

> Know the enemy, know yourself; your victory will never be endangered. Know the ground, know the weather; your victory will then be total.
>
> —Sun Tzu

The development of a tactical system in theory is one thing, but in practice tactics will always occur on the ground, the waves, or in the sky. The tactician must translate his mission and his vision for its accomplishment into a plan that can be executed in the real world. It must both mitigate the disadvantages of the terrain and exploit its advantages. The finest tactical coup is useless if the troops cannot execute it. The tactician therefore must take into account the terrain and environment in which he operates. Much like strategy, the effects of the environment are pervasive.

For ground operations, Sun Tzu's chapters on types of terrain, written centuries ago, almost cannot be improved on. In his chapter 10 he presents six types of ground: accessible, entrapping, indecisive, constricted, precipitous, and distant. These six types relate to the ground and the advantage or disadvantage conferred by it on the military force that occupies it (table 15.1).

Table 15.1 Six Types of Ground

Type of Ground	Advantage/Disadvantage	Description
Accessible	Easily traversed by either side	Flat ground, roads
Entrapping	Once acquired, difficult to leave	Valleys, draws
Indecisive	Equally disadvantageous to both sides	No-man's-land between trenches
Constricted	Not easily traversed, but easily controlled	Mountain passes
Precipitous	Advantageous to whomever occupies it	Hills, ridges
Distant	Enemy cannot be easily affected	Anywhere the enemy is protected from fires or attack

Source: Sun Tzu, *Art of War*, 124–25.

In his chapter 11 Sun Tzu lays out "Nine Varieties of Ground." There is some overlap with the types listed above. The nine varieties are dispersive, frontier, key, communicating, focal, serious, difficult, encircling, and death. Again, these are not just descriptions of terrain features but a codification of those features as they relate to combat. Death ground, for instance, can be any type of terrain. It exists only when a military force is completely trapped and cannot escape from its enemy. The trapped force will fight harder and with reckless abandon, a recognition of the interaction between the physical and moral planes. The situation means death for both sides. The major difference in the nine varieties is that the sentiments of the local population are taken into account (table 15.2).

Table 15.2 Nine Varieties of Ground

Type of Ground	Description	Advantage/Disadvantage
Dispersive	Troops' home territory	Population friendly, logistics easier
Frontier	Enemy territory	Population unfriendly, logistics stretched
Key	Advantageous	Decisive terrain
Communicating	Easily traveled by both	Roads or paths, flat ground
Focal	Ground surrounded by third parties	Population neutral but could be swayed to either side
Serious	When you are so far into enemy territory that you are overstretched	An enemy attack on your supply lines possible and potentially devastating
Difficult	Mountains and marshes	Terrain more difficult to traverse than communicating terrain
Encircling	Where one can be surrounded	A flat plain surrounded by ridges
Death	A trapped army that must fight to the death	A surrounded military unit

Source: Sun Tzu, *Art of War*, 130–33.

The dynamics of sea state and aviation are too complicated to be described here, but terrain and weather concerns are even more important for sailors and aviators. The sailor must be concerned with winds and tides that can change in an instant and he must be cognizant of the depths below him where submarines might lurk. The aviator cannot fly if weather is contrary, and thus the soldier must also be aware that his air support could be disabled.

A more modern concept when it comes to terrain is the idea of lines of communication. Current U.S. military doctrine defines a line of communication as, "A route, either land, water, and/or air, that connects an operating military force with a base of operations and along which supplies and military forces move."[1] In any case, military forces will be limited in terms of where they can move. Mechanized forces move more easily along road systems and must bypass mountains and rivers. Ships must move on

the water, and the water must be deep enough for the hull. Even aviators must be cognizant of air space that is sometimes controlled by civilian authorities. The tactician must be aware of where and how he can move troops and supplies, and can use his knowledge of the enemy's logistics capabilities to predict where he will move.

The advancement of technology has done nothing to nullify the effects of terrain and weather. American infantrymen in Iraq suffer through sandstorms just like Alexander the Great's troops did in 331 BC. In the tradition of Sun Tzu, the Chinese used terrain and weather to great effect in 1950 during the Korean War. The UN forces on the Korean peninsula believed the war was won as they approached the Yalu River that forms the border between North Korea and China and Russia. But Mao Zedong (or Tse-Tung)'s People's Liberation Army would combine effective use of terrain and weather with mass, maneuver, tempo, deception, and surprise to deal U.S. forces one of the worst defeats in their history.

In October 1950 the North Korean communist forces under North Korean premier Kim Il-sung were collapsing. UN forces led by the United States had pushed North Korean forces out of South Korea after breaking the back of their offensive at Inchon in September. The collapse happened so quickly that UN forces were nearing the Chinese and Russian borders, prompting frantic discussions between Chinese leader Mao Zedong and Soviet dictator Joseph Stalin. UN forces were advancing northward along two axes: the western force was the Eighth Army under Lt. Gen. Walton W. Walker and the eastern force was X Corps under Gen. Edward Almond. Both reported to Gen. Douglas MacArthur in Tokyo. Due to the rugged and mountainous terrain of Korea, each column was "virtually in isolation from each other."[2] As the troops moved northward, the terrain chopped units up into groups as small as companies, making mutual support difficult or impossible. Additionally, the movements and deployments of UN forces were detailed in the press every step of the way.[3]

Both China and the Soviet Union were worried that the thus-far victorious UN forces would not stop at the Yalu, but it was China that responded with action. As early as June, Chinese troops under veteran general Lin Paio began moving across the border into North Korea. These troops were further reinforced and, by October, 12,000 troops had crossed

into North Korea. By November around 180,000 Chinese troops were in the vicinity of Eighth Army and some 120,000 were near X Corps in the east.

Despite the large numbers of Chinese troops, the UN forces had no idea they were there. The Chinese accomplished this infiltration with a strict deception plan that used the terrain itself. First, China announced that "volunteers" would fight with North Korean forces, but in actuality Chinese forces would fight as units. Mao Zedong even went so far as to rename the Chinese Fourth Field Army as a volunteer unit. Once inside Korea, Chinese units moved into deep valleys to hide from aerial observation. The troops marched only at night and were heavily camouflaged during the day. Soldiers that violated orders to stay hidden were summarily executed. Since the Chinese used no air forces or heavy artillery and very few motorized assets, U.S. Air Force patrols completely missed the troop movements. Finally, taking notes right out of Sun Tzu, the Chinese had some troops defect to UN forces with fake information. Other troops were given false information just in case they were captured.[4]

UN forces thus continued to attack north in complete ignorance that an entirely new enemy was waiting for them. By late October, Eighth Army units were advancing so fast that they were about to stumble on Chinese forces. On 25 October the Chinese launched a spoiling attack aimed mostly at South Korean and U.S. forces in the west.[5] Chinese infantry attacked many units from multiple sides at once. After a week of fighting, Chinese forces disappeared again.

The spoiling attack—called the "first offensive" by the Chinese—halted the Eighth Army advance and sowed confusion in the UN high command. Headquarters in Tokyo still denied that the Chinese forces even existed. When they finally admitted that Chinese units must be in Korea, they estimated that there were 40,000–70,000.[6] There were 300,000. MacArthur ordered the advance resumed and even promised the troops that they would be home for Christmas. He assumed that even if Chinese forces were in the area, the firepower of the Air Force would destroy them.

Meanwhile, the Chinese forces were studying the initial fighting. They developed tactics on the spot that would nullify U.S. advantages in combined arms by maneuvering through gaps in UN lines created by the terrain to isolate units and attack them from all sides. Chinese troops,

waiting for the weather to turn, were already hidden behind the American forces.[7] Lin Paio was waiting for the weather to turn. UN forces had yet to experience a harsh North Korean winter. Chinese forces were inured against the cold and were well-equipped with cold weather clothing. The cold would disable heavy UN equipment and aircraft, but the Chinese forces had none anyway. Temperatures would fall to zero degrees and below, offering an advantage to the better prepared Chinese troops.

On the night of 25/26 November, the Chinese struck.[8] During the "second offensive," Chinese units attacked in columns. Where Chi-nese units struck UN lines, they withdrew. Where they found gaps, they used them to maneuver against exposed flanks. Many U.S. units decimated Chinese units, but most were confronted with overwhelming mass. Most units of the army of South Korea Army disintegrated under the pressure. The retreat of the Eighth Army was facilitated by a Turkish brigade that stayed behind and held the Chinese back for two days before the Chinese destroyed it.

But too many Chinese troops had maneuvered behind UN lines. One Chinese division set up a six-mile-long ambush on the withdrawal route.[9] Pyongyang was abandoned as the Chinese harried and harassed the Eighth Army south.

The attack in the east began on the night of 27/28 November with similar results, although United States Marine Corps troops that kept regiments and battalions together with artillery units fared better and held out. Many other units, fragmented by the terrain, collapsed. X Corps retreated east to form a beachhead on the coast. All along the route, Chinese forces set up roadblocks, mined roads, and ambushed the freezing UN troops, exploiting the success of their surprise attack.[10]

By mid-December, however, the cold weather affected even the Chinese. Soldiers on both sides froze to death, wounded and otherwise. Chinese units were observed avoiding fights with the UN forces.[11] X Corps managed to execute an amphibious withdrawal to South Korea and Eighth Army consolidated on the 38th Parallel. On 26 December the Chinese "third offensive" hit Eighth Army, which again retreated, this time losing control of Seoul. (UN forces would retake that city in March 1951.)[12]

The Chinese attack was a tactical masterwork that demonstrates a number of the concepts laid out herein. Despite the unmitigated success of the UN forces against North Korea, they had reached a culminating point thanks in no small part to MacArthur's personal hubris. Despite massive American advantages in firepower, the Chinese developed a tactical plan based on maneuver and mass that nullified Allied firepower. The Chinese then executed a detailed deception plan that completely misled U.S. intelligence, leading to complete surprise and confusion among UN forces. The shock of the main attack shattered moral cohesion, especially that of recently formed South Korea formations but also that of some U.S. forces. The attack resembled tactics of guerrillas executed on a large scale, and utilized both terrain and weather to great effect. Chinese forces did not explicitly operate on the tenets of mission command but, since they lacked any kind of radio communication, subordinate commanders were on their own once an attack was launched. The surprise was so total that the UN forces lost the initiative and were on the defense before they even realized it, as demonstrated by the renewed advance after the initial Chinese attacks. Still, UN forces did not break entirely. The Chinese attack culminated in turn and South Korea was preserved.

Many of the best military commanders in history relied on mastery of terrain to succeed. George Washington was a land surveyor as a young man. Napoleon had gigantic maps made that he would crawl over when planning his battles. Robert E. Lee began his career as an engineering officer, well-versed in fortification (recall the discussion of the Battle of Petersburg in chapter 4). The use of terrain, especially when fortified, has not lost its importance across the centuries of military history. Julius Caesar used fortifications to win the Battle of Alesia in 52 BC. The massive artillery firepower brought to bear during World War I could not defeat earthen trenches. In 1956 during Operation Kadesh, Ariel Sharon, then an officer in the Israeli Defense Force, overran Egyptian defensive positions by sending his tanks directly at them with either the rising or setting sun directly behind them, blinding the Egyptian defenders.[13] Today ISIS fighters, their Kurdish Peshmerga enemies, and Houthi rebels in Yemen are using trenches to enhance defensive positions and ISIS fighters have even executed successful attacks using the cover of sandstorms. The timeless importance

of geography is a lesson and a warning to modern tacticians and another reason why the study of military history is a vital aspect of their education.

16

CROSSING THE BRIDGE

Linking Tactics with Strategy

> The musical notes are only five in number but their melodies are so numerous that one cannot hear them all. The primary colors are only five in number but their combinations are so infinite that one cannot visualize them all. The flavors are only five in number but their blends are so various that one cannot taste them all. In battle there are only the normal and extraordinary forces, but their combinations are limitless; none can comprehend them all.
>
> —Sun Tzu

Colin S. Gray describes strategy as a bridge between the tactics that occur on the battlefield and the policy goals that those tactics are intended to secure.[1] This is an apt metaphor for the concept. Strategy is a two-way thoroughfare, enabling the necessary modifications of tactics by policymakers to bring them in line with political goals and allowing policymakers to make decisions informed by the practitioners that must strive to achieve those goals. A policymaker who does not understand the capabilities and limitations of the tacticians cannot make effective policy.

The policymakers' representatives on the tactical side of the river are the commanders at every level, even platoon commanders and NCOs. Just as it is incumbent on the policymakers to understand what can be realistically achieved by the tacticians, it is incumbent on the commanders

to employ tactics in times, places, and ways that achieve the goals of policy. Anything less is negligent.

Clausewitz describes the strategic effect on the losing side of a successful tactical victory: "The effect of all this outside the army—on the people and the government—is a sudden collapse of the most anxious expectations, and a complete crushing of self-confidence. This leaves a vacuum that is filled by a corrosively expanding fear which completes the paralysis. It is as if the electrical shock of the main battle had sparked a shock to the whole nervous system of one of the contestants."[2]

Notice the prevalence of mental and moral effects in this description. Events on the battlefield do not remain there; they resonate among the defeated army and among the government officials whose policy is now in danger and the people whose soldiers were defeated. War is not won on the battlefield; it is won by the effect of battle on the strategic level. One example is the Tet Offensive in South Vietnam in 1968. The NVA and Viet Cong forces that attacked American forces throughout the country achieved no military objective, but the realization that the allegedly losing communists were still quite capable had far-ranging and outsized mental and moral effects on the American side.

Additionally, tactical victories must be defined. A true tactical victory is won when the cumulative physical and mental means of one side shatters the moral cohesion of the other, as we have seen. This, however, should not be taken to mean that the shattering of moral cohesion is sufficient. It is merely the means to an end that the tactician will further seek through exploitation at the tactical level (which will usually mean the destruction or at least attrition of the enemy force), and the use of the victory for the purpose of the war, to borrow Clausewitz's phrase.

For tactical victories to be strategically effective they must be aimed at a center of gravity. The concept of a center of gravity is a tendentious one and the use of the term here should not be confused with the tactical concept in use by the U.S. military today. Clausewitz defined the center of gravity as "the hub of all power and movement, on which everything depends. That is the point against which all our energies should be directed."[3] Examples include the enemy's army, his capital, a single commander/sovereign (such as a Napoleon), or even an ideology. It is commonly asserted that

Clausewitz believed that the enemy's army is always the center of gravity. He did not, although he believed that was frequently the case. Napoleon himself did not always correctly identify a center of gravity. In 1812 Napoleon defeated the main Russian army at Borodino and then occupied and burned Moscow, and the Russians did not surrender. Spain never truly capitulated to Napoleon. It is surprising that Clausewitz focused so much on defeating the enemy's army when it failed for his exemplar strategist.

If a successful operation does not produce an effect on the enemy's center of gravity, it is ineffective or wasteful. In order for a successful battle to have a beneficial effect on the wider war effort, thus contributing to the successful achievement of the policy that produced the war, it must affect the enemy center of gravity. This is the job of strategy: directing tactics toward the policy goal. It is also why tactics are never independent of strategy. The tactician is subordinate to the strategist and thus cannot be ignorant of strategy's precepts.

An example of this dynamic is provided by Thucydides in his history of the Peloponnesian War.[4] That war, fought between Sparta and its allies and Athens and its allies, demonstrates the futility of tactical success disconnected from strategy. In the fifth century BC, Sparta was the dominant land power in Greece. Sparta's professional army—made possible by the enslavement of the *helots*—completely outmatched the citizen armies of the other city-states, including Athens. Athens, however, had far and away the most dominant navy in the region and used it to maintain its economy through its allies. Sparta's center of gravity, then, was its army where Athens' center of gravity was the empire maintained by its navy.

Sparta's initial moves involved repeated invasions of Athenian territory every summer. The Spartans ravaged Athenian crops, which starved Athens. Knowing that their citizen army could not defeat the Spartans, the Athenians refrained from fighting them. The invasions were such unmitigated tactical victories for the Spartans they were not even contested. These repeated tactical successes on the part of the Spartans produced no strategic effect. Athens simply imported supplies via its maritime empire. By contrast, when the Athenians used their navy to land troops in Spartan territory—thus threatening the *helots* that supported Spartan society—it

produced immediate strategic effects. The Spartans rushed to defend their home territory due to this threat to their political system.[5]

The Spartans did not find success until a young Spartan named Brasidas proposed a new strategy. Brasidas recognized that the Athenian center of gravity was Athens' maritime empire; his plan was to take a small force overland to induce Athenian allies to revolt and support them against Athenian reprisals. From 425 to 423 BC, Brasidas succeeded in inducing six Athenian cities to revolt. Once Brasidas had begun detaching cities from the Athenian empire, the Athenians were forced to go on the offensive on land and dispatch an army to confront him. Although Brasidas was killed in the ensuing battle, he had succeeded in directing Spartan tactics against the Athenian center of gravity. This strategic realignment of tactics with the Spartan policy of defeating Athens, produced by a tactician, upended Athenian plans and forced them to react.

Sparta would eventually win the war, but not until it had defeated the Athenian navy and shattered Athens' empire. The actions of Brasidas marked a turning point in the strategies of both sides. Before Brasidas, there was no bridge connecting Spartan tactics with the policy goal of victory over Athens. Once that conceptual bridge had been built, all Spartan decisions flowed from it. Athens began the war with a workable strategy: avoid direct confrontation with the Spartan army and use its navy to its advantage. Once Brasidas had upended this strategy and it could no longer achieve Athenian goals, Athens never found another effective strategy. The Athenians even involved themselves in a costly and disconnected attempt to conquer the island of Sicily, demonstrating that the directing function of their strategy bridge was not in effect.

The lesson of Brasidas is that although he was a tactical leader he was aware of the strategic situation and utilized tactics that supported that situation; perhaps most importantly, his battlefield view informed the policymakers to the point that they made an adjustment based on his proposals. Previous Spartan commanders had failed to serve strategy, but the lesson of Brasidas was well-learned by his fellow citizens.

In *The Strategy Bridge* Colin S. Gray wrote, "They [strategic actors] use their tactical behavior to secure a strongly net positive strategic effect." Brasidas' actions meet the above definition. Gray goes on to say, "If the

troops at the sharp end cannot win in combat, then it has to follow that operational art, its directing strategy, strategy's guiding policy, and the politics that created it must be frustrated."[6] The entire effort rests on the tactician's actions and his ability to supply strategy with its necessary currency: strategic effect.

The problem is that tactical actions can also have negative consequences for strategy. Even a victorious battle can produce a negative strategic effect if prosecuted in a manner that goes against international norms. For example, the Germans achieved tactical successes with poisonous gas on the western front during World War I, but the German tactical success was a strategic gain for the Entente whose propaganda effort against the Central Powers was fueled by such atrocities. The Germans' tactical gain was negated by presumably increased recruiting and the moral cohesion it produced in the Entente who viewed itself as good and Germany as evil. By playing into their enemy's narrative for a few meters of advance, the Germans made a devastating strategic mistake.

Strategy is so important, even to the tactician, because the art of strategy is the subordination of short-term tactical goals to long-term policy. The strategy informs the tactician as to how options will, or will not, serve the quest to achieve policy goals. Another example from the ancient world suffices to illustrate this point. Julius Caesar was a master tactician, which he had proven during his ten-year-long conquest of Gaul. In 49 BC, however, Caesar launched a bid to gain control of the Roman Republic itself; the opposition was led by his former ally, Pompeius Magnus, known as Pompey the Great. As Caesar moved south through Italy toward Rome, he encountered troops loyal to Pompey guarding towns and other positions. His legions would have to surround these positions to force a surrender. Rather than fight the opposing soldiers, Caesar offered a deal: lay down your arms and I will let you join my army or, if you do not want to fight for me, I will just let you go. We know this because Caesar's description of this strategy has come down to us in the form of one of his letters to allies in Rome: "Let us try in this way, if we can, to win back public opinion and gain a lasting victory. For all others have incurred hatred through their cruelty and failed to maintain their victory for long. . . . Let this be a new way of gaining victory; let us secure ourselves through mercy and

magnanimity!”[7] Caesar knew that to rule Rome, he had to win Roman public opinion.

The obvious tactical option for Caesar was to fight and kill the troops loyal to Pompey: fewer enemy troops to deal with. But this is where Caesar proved that he was a master strategist in addition to being a master tactician. He needed troops in case the war lasted a long time. Even if he won quickly, he would need the political loyalty of those troops. If he killed them all, other enemy troops would only fight harder to avoid being killed themselves. In this way, he gained new recruits while depleting the forces of Pompey. Even the troops who simply walked away served a purpose: they spread the word that Caesar was generous and benevolent and thus more men would desert from Pompey’s armies and join Caesar’s in the future. This strategy also won him favor in the eyes of Roman citizens. Caesar’s willingness to forgo the easy, obvious tactical option in a way that served the wider strategy was integral to his victory. Caesar not only beat Pompey—at Pharsalus in 48 BC—but he also seized total control of Rome itself, something that Hannibal had failed to do. If tactics and strategy do not align, the demands of strategy must override tactical sense.

The American war effort in Iraq beginning in 2003, termed Operation Iraqi Freedom, is a glaring example of tactics, strategy, and policy in disarray. The policy as set forth by the Bush administration was to create a democratic Iraq along Western liberal political ideals. The strategy that was supposed to lead to this state of affairs was the defeat of the Iraqi army and the destruction of the regime of Saddam Hussein. From that flowed the tactics of the Coalition armed forces. In a blindingly fast campaign, American and allied troops dismantled the Iraqi army and ousted the Hussein regime from Baghdad.

The U.S. military and its allied militaries from the international coalition were ideally suited to accomplish the Bush administration’s goals. The American forces in particular were designed for such fast-paced combat operations employing massive amounts of firepower against enemies using Soviet Bloc doctrine and weaponry. Additionally, the flat desert environment of Iraq was perfect for U.S. doctrine and gave the Iraqi army virtually no opportunity for cover or concealment above the small unit level. Finally, the Iraqi soldiers were poorly led and trained, and morale was

low. Few were loyal enough to the brutal Hussein regime to be morally strong enough to face American military might. In some cases, the Iraq army did put up stiff resistance, such as at the Battle of An Nasariyah. On the whole, however, Coalition tactical prowess dissected the Iraqi army. The first U.S. units reached Baghdad in a matter of days, leaving the control of Iraq in U.S. and British hands.

While the tactics of the Coalition had indeed destroyed the Iraqi army and removed Saddam Hussein from power, it quickly became obvious that achieving those two objectives was an insufficient strategy bridge to carry the Coalition to its political end state, despite premature declarations of victory. The goal of conjuring a democratic Iraqi political system was not, and never could be, served by strictly tactical victory, no matter how overwhelmingly one sided. Tactical practitioners at the highest levels should have pointed out the poor strategic assumption that underpinned the American plan for Iraq, but they did not. With few exceptions, the U.S. military saluted and sallied forth.

This blind leap into the breach again on the part of the U.S. military was the result of generations of conditioning after the Vietnam War. Stung by that defeat, the U.S. military willfully buried both counterinsurgency operations and the study of strategy, assuming that the United States could choose not to engage in such dirty wars. Many blamed the strategic disconnect during Vietnam entirely on the policymakers rather than recognizing the tactician's responsibility to strategy. The officer corps instead focused on major conventional war. With the American officer corps buried in the sand of tactics for generations, they could not even identify strategic bankruptcy when it exploded under them.

That explosion occurred shortly after their blinding success against the paltry Iraqi defense. As progress toward a democratic Iraqi government crawled along, the American occupying force found itself confronted by an enemy that was it was in no way designed to fight in a type of warfare it had deliberately ignored. Like the Athenians, the strategic game had been changed and the U.S. military found itself on the field without a playbook.

The threat of the growing insurgency was not tactical: American troops could outfight almost any concentration of amateur insurgents. The problem was that defeating insurgent guerillas in fight after fight in no way produced enough positive strategic effect to lead to a political decision. The U.S.

military had fallen for the misinterpretation of Clausewitz that stated that the center of gravity was the enemy army. This had been true for the Hussein regime, but that regime was gone. In its place was an insurgency fueled by dissatisfaction with the provisional government, instigated by foreign terrorists motivated by ideology, and quietly supported by countries like Syria and Iran. The U.S. military found itself in a place similar to Sparta's before Brasidas: in possession of the most dominant military force but without a suitable target.

But like Sparta, the United States undertook a strategic reassessment. The result was a new doctrinal manual, *FM 3-24 Counterinsurgency;* the Bush administration reinforced the forces then in country.[8] The new manual stressed tactics that would better serve the political goal of a stable, democratic Iraq such as the protection of the population, working with local allies, and building an indigenous security force. The U.S. military recalibrated its tactics based on a reassessment that reconnected tactics with policy goals and then deployed sufficient troops to implement it.

To be sure, recalibrated tactics were not the sole factor in the subsequent decrease in violence that allowed the United States to eventually withdraw. It might not have even been the most important as the Anbar Awakening and the demographic changes wrought by the civil war between Sunnis and Shias certainly contributed.[9] Additionally, subsequent events in Iraq have called into question whether the U.S. withdrawal was or was not a sound decision. The American strategic recalibration, however, does provide a case study of an attempt to bridge the gap between tactics and strategy that produced, for a time, positive strategic effects. It is also a stark reminder of the dire necessity that tacticians understand the strategy they serve. Hard-headed pursuit of tactics that do not serve the strategy wastes the lives of the troops that must carry the strategy out.

We have seen that tactics must serve a higher strategy that seeks to achieve a political goal. We have also seen that the tactician on the field of battle must make snap decisions in order to achieve a tactical victory. How can a nation ensure that its tacticians serve the strategy? This challenge is a central aspect of the strategy/tactics dynamic. A strategy must be decided by the highest authorities but must also unify the actions of subordinate leaders. It must be a centralized, top-down function. As we have seen,

however, decentralized and bottom-up command is superior on the battlefield. Many nations and military organizations choose one or the other: centralized or decentralized control. This is a false choice and the strategy/tactics dynamic can assist in understanding how to solve that central paradox. Strategy must be centralized but tactics must be decentralized. If the tacticians understand the central strategy, it can unify their decentralized decisions. This requires that those who plan strategy accept that tacticians must be given space within which to operate, not specific directives. Strategic command is not like laying down inflexible train tracks or even a road with specific lanes. It is like carving out a series of canals with left and right limits within which water will flow. The tactician might float one way or the other, but his ultimate end acts as a guiding star. The destination might be the same, but the specific demands of time and space determine the exact route. Resolving this paradox between strategic command and tactical command is the central mission of a nation's military structure.

17

CONCLUSION

> The ultimate determinant in war is the man on the scene with the gun.
>
> —Adm. J. C. Wylie, USN

Although this book is about tactics, it must conclude with a word about the relationship between the tactical and the strategic. Tactics should not be executed, and neither should they be studied, in a strategic vacuum.

Strategic theory is an inaccessible field of study. Most of the major texts are old and difficult for modern readers. Clausewitz's *On War* especially, unfinished as it is, is a dense and challenging text that requires years of study and repeated readings to understand. In recent years, the term "strategic corporal" has been used to describe the need for tacticians to understand strategy. The U.S. military, however, persists in not providing its NCOs and company grade officers with even a basic introduction to strategy. Lieutenants in particular, who can be the sole link between strategy and the tactical actions occurring at bayonet range, are purposely left ignorant of strategy. Military officers are typically not even introduced to strategy until they are senior majors and lieutenant commanders, at which point they have been implementing strategy for well over a decade. Even the reading lists of the services do not include works of strategic theory until this point. Enlisted leaders get nothing.

This lack of strategic education has produced a United States military adrift. A cottage industry of shallow military thought attached itself to the Department of Defense like a parasite, selling "new" concepts that ranged from the specious (such as the RMA and effectsbased operations), to the banal (like "hybrid" and "asymmetric" warfare), to the nonsensical (like 4th Generation Warfare and Gray Zones/Wars). An American officer corps, bereft of a solid understanding of strategic theory, seizes on concept after concept, seeking the next shiny silver bullet that it can fire to kill the specter of strategic disarray.

Any bridge needs a foundation on both sides of the river. The foundation on the warfare side inhabited by the tacticians should be a tactical theory: a paradigm of how to win in combat that is both timeless and broad, but is nevertheless cognizant of its imperative to span the river. The foundation of tactical theory, and thus doctrine, has for decades used a list of the principles of war. As we have seen, however, they are not principles of war but of warfare; they jumble physical, mental, and moral means of achieving victory into one bin, and the list format implies and enforces a checklist mindset that can stunt tactical creativity. The principles of war should be replaced by a tactical system based on those three planes of tactical interaction that will lead to understanding of when principles should be combined—and when they should be ignored.

For the system developed in this book the first precept is that tactics are subordinate to strategy. Just as war, and thus strategy, are subordinate to policy, tactics are in turn the servant of strategy. The tactician employs tactics that will best serve the strategy, but he must also know when a flawed strategy cannot be achieved with reasonable tactics. Duty might still demand that he try to accomplish the mission, but he will need to inform the strategist that his aims are improbable.

Another precept is that no plan of battle can guarantee success. Every tactical action is subject to "the play of chance and probability."[1] Good battle plans can, however, change that probabilistic equation and tilt it in the favor of the clever tactician. He can do this through physical, mental, and moral means.

The four physical means at the tactician's disposal—mass, maneuver, firepower, and tempo—are easy to remember; potential tactical actions can

be evaluated based on their combination of the four tenets. Used to advantage, these four tenets can raise the probability of tactical success.

The mental effects that physical means can inflict on the enemy—deception, surprise, shock, and confusion—provide another layer to the tactician's understanding. The tactician's true target is his enemy's mind and he cannot target it without understanding the mental state he wishes to achieve and how his physical deployments can facilitate it.

Military history also teaches a number of concepts that the tactician must be aware of, and the most effective ways to plan and organize around them in order to be successful. The concepts laid out in part II are the backdrop of tactics, realities that must be contended with when arranging mass and maneuver, firepower and tempo. The key for the tactician is not to know the tactical tenets and concepts: the key is to understand them well enough to adapt them to a particular situation in order to achieve tactical success.

This tactical theory can be of practical use to the tactician as a foundation on which to build a plan for execution. If he understands the strengths and weakness of both friendly and enemy forces, a plan that fits the situation in terms of physical, mental, and moral aspects will be easier to ascertain. This tactical theory highlights the most important, but not the sole, methods and determinants of victory. The tactician can then evaluate courses of action against this system since it provides benchmarks and anchor points for analysis. This theory can also assist the tactician in choosing the appropriate forces to carry out the plan. For example, modern special operations forces are designed to foster high tempo and surprise. A tank company, however, can combine mass, maneuver, firepower, and tempo in a way that no special operations unit can. A plan that demands firepower and mass is obviously more appropriate for the tank company. If this tactical system were adopted as a standard across a service or services, it would allow faster and more efficient planning by acting as a single sheet of music that all personnel can easily understand. The theory also organizes the field of tactics. Nearly any case study from military history, procedure from doctrinal publications, and the tactician's own experience can be understood and analyzed through a prism of the tactical tenets in part I and the tactical concepts in part II. Therefore, this work has met Carl von

Clausewitz's test for the use of theory by assisting in the achievement of victory in battle at the tactical level.

Tactical success is defined by the shattering of the enemy's moral state. Every enemy is a breathing, thinking, feeling human being, animated by thoughts of patriotism, duty, and ideology. This moral cohesion underpins his very presence on the battlefield and his will to resist the designs of the opposing tactician. True tactical success occurs when the enemy force is shattered on the moral level, when he can no longer physically resist or mentally conceive of a way to do so. When the tactical equation is tilted so far against the enemy that even the lowest private throws down his weapon and thinks not of his duty but of his base and animal desire to escape and live, the tactician has won.

Once this victory has been achieved, the tactician must exploit the tactical success. Here "strategy at this point draws near to tactics," as Clausewitz said.[2] Various audiences perceive tactical events and are affected by the outcome. The victors are flushed with the thrill of victory. Their government inches or even leaps toward the policy goal. The civilian population, local or otherwise, takes heart that they are defended or served by great warriors or stolid soldiers. The losing side experiences the opposite. Effective exploitation of a tactical victory—which is the result of ensuring its positive service to the strategy and magnifying its effect—is the difference between victory and decisive victory.

This system, a way of thinking about tactics while not ignoring their intimate connection with strategy, is designed to be simple enough even for the young corporal to understand and the green lieutenant to master. Of course, these tenets should be "used as points of reference rather than standards of measurement."[3] It is a system not of immutable laws but rather of general tenets that assist in thinking about and planning tactics. It can help the tactician decide what course of action will most likely lead to success, but cannot act as a set of rules that will automatically result in victory. To return to our analogy to the physical sciences it, like quantum mechanics, "does not predict a single definite result for an observation [or tactical event]. Instead, it predicts a number of different outcomes and tells us how likely each of these is."[4]

The tacticians that inhabit the battlefield side of the river accrue victories that build the strategy bridge, but always with an eye toward the opposite shore. Woe be the engineer that builds a bridge without first checking that there is indeed land on the other side. The policymakers decide, with the tacticians' input, where the bridge should be placed. But it is the accrual of tactical success that provides the rebar and concrete.

The U.S. military is inarguably the most tactically advanced military force on the planet, and arguably the most tactically advanced in history. It is so dominant in direct battle that its opponents refuse to meet it in open battle, except in cases of extreme incompetence like Iraq in 1991 and 2003. Instead, its opponents choose strategies that they can achieve through tactics that the U.S. military has not mastered. Strategies of erosion or exhaustion are typically pursued by guerrilla tactics that the U.S. military is just not built to fight. This was evident in Vietnam where the U.S. military was faced with both a conventional and a guerilla enemy, in both Iraq and Afghanistan after the initial invasions, and in the wider terrorist war against the West. Opponents in each case pursue a strategy of exhaustion that can be effectively pursued by guerrilla tactics that deprive the U.S. military of a target that it was built to annihilate. Our enemies have learned this. We have not.

In the case of the war on terror, the location of the strategy bridge has been planned for the place where the last successful bridge was built. But tectonic shifts in the character of warfare have changed the strategic geography. Overwhelming military success once was enough to bridge the gap between tactics and policy, and thus was a sufficient strategy. Military success alone is no longer enough to provide enough strength or length to the bridge: military success is only the means to an end. If we do not understand our end, no means will accomplish it, and battle becomes only slaughter.

APPENDIX A

The Principles of Planning

> Plans are nothing; planning is everything.
>
> —Gen. Dwight D. Eisenhower

The United States military approach to planning is mechanistic. The production of operational plans is dominated by the U.S. Army's military decision-making process and the U.S. Marine Corps' planning process. The differences between the two are facile in nature. Each is a step-by-step course that mandates the completion of various products whose utility ranges from the useful to the useless. Adherence to the labyrinth of esoteric rules is ruthlessly enforced, so much so that the process becomes the mission and the mission a tidy but completely useless stack of pages containing the facsimile of a plan. One can become an expert in the byzantine constitution of planning and still be completely ignorant of planning outside the military, because the labyrinth becomes a prison. Even the truncated rapid reaction planning process is still a process and thus a restrictive pipeline leading to an identical stack of papers.

Still, planning is an essential method to translate the conceptual, abstract theory of tactics presented in this book into a practical, executable plan. Much as with tactics, there is no accepted way for thinking about planning. This is evident in the various lists of the principles of war because most of them include recommended, sometimes vital, aspects of planning that are not actually tactical principles. Rather than just reject these otherwise sound principles from the tactical tenets herein, I have compiled a list of principles of planning to assist staff officers when evaluating their

plans and the processes by which they are produced: simplicity, flexibility, unity, economy, time, and communication.

Simplicity

Simplicity is one of the classic principles that is simply a good idea, but it is not inherently superior to complexity when it comes to warfare. The M777 155-mm howitzer is infinitely more complex than the bow and arrow, but few would choose to arm themselves with the bow and face an opponent backed up by a battery. The same is true when it comes to planning: a campaign plan that combines firepower, maneuver, mass, and tempo is far superior to a plan that relies simply on mass. Deception can overpower them all, but the execution of an effective deception plan is rarely a simple endeavor.

But simplicity appears on many versions of the principles of war and remains here in these principles of planning. It does so primarily as a warning against becoming too complex: a plan that is too complex for troops to actually execute is less than useless, just as a weapon too complicated to operate is useless. Staffs should therefore strive for simplicity whenever possible. Plans, even if complex, should be easy to understand and communicate. The staff should create products during their planning process that are brutally simple, and should shun the ruffles and flourishes demanded by so many higher-level commanders. Time spent by a staff making the presentation to the general aesthetically pleasing is time mortgaged, and the interest is paid with the blood of the troops. Of course, if simplicity is beneficial to one side, complexity is harmful to the other. But many simple attacks and efforts, delivered rapidly and from unexpected but advantageous angles (both physical and mental), will appear complex to an enemy.

Finally, a common theoretical education can foster simplicity and efficiency on the part of both staffs and the troops they support. The 2003 U.S. invasion of Iraq, for example, was a massively complex undertaking involving thousands of troops and millions of pounds of supplies moved over hundreds of miles. But in terms of this system, it looks much simpler. On the physical plane it involved a left-flank attack supported by a fixing direct attack to apply mass and firepower at decisive points and at speeds

with which the Iraqi army could not cope. It was preceded by the mental effects of the U.S. Air Force "shock and awe" campaign and an effective deception plan. Despite their numerical superiority, the moral cohesion of the Iraqi army—and indeed the regime of Saddam Hussein as a whole—was shattered. While the details of this plan required thousands of professionals with detailed knowledge and skills to execute, the overall plan could have been explained to the greenest of troops in a matter of minutes. That is the goal of simplicity.

Flexibility

Flexibility rarely appears in the principles of war, although there are those who have pushed for its inclusion for years. In 1999 Lt. Col. Robert Frost wrote a paper for the U.S. Army War College Strategic Studies Institute proposing that the United States adopt flexibility as a principle of war.[1] He was undoubtedly correct about its necessity and its importance. It is, however, a better fit as a principle of planning than of war.

For the reason that flexibility must be included we turn once again to Carl von Clausewitz who identified the play of probability and chance as one of the three aspects of the nature of war. Probability is pervasive in warfare and commanders at all levels must be concerned with it. As Robert Burns put it, the best-laid plans of mice and men often go awry, and mere fortune can overturn the best plan of the best staff on their best day. In the words of military historian John Keegan, "Plans do not determine outcomes. The happenings set in motion by a particular scheme of action will rarely be those narrowly intended, are intrinsically unpredictable and will ramify far beyond the anticipation of the instigator."[2]

The danger of chance overturning the chess board, so to speak, is mitigated partly by the detailed work of the staff and partly by an *Aufragstaktik,* or mission command, style of command and control as discussed in chapter 14. Another method by which the staff can mitigate probability is the use of branch and sequel plans. If time allows, these subsidiary plans can be used to provide options to commanders in certain situations. A sequel plan is simply a plan that is meant to occur after the primary plan, such as in the event of particularly effective—or particularly

incompetent—execution. For example, if the mission is accomplished with sufficient daylight left for another advance, a sequel plan can be used to execute that further advance. A branch plan is one developed in the event that the everchanging tactical situation changes to the point that a completely different plan than the one originally developed must be executed. If part of the primary plan involves attacking an enemy tank platoon on the left flank but reconnaissance assets find that platoon on your west flank, you would use a branch plan to deal with this wrinkle.

Unity

Unity is expressed in two ways on classical lists of the principles of war: unity of command and unity of effort. They mean essentially the same thing but their varied definitions are evidence of their poor explication thus far. Unity of command means that at some point high in the chain of command one person is in charge, and unity of effort means that every friendly unit is working toward one purpose. Both of these concepts are too reductionist to stand on their own.

The idea expressed by unity of command that one person should be in charge of a military force is a farce in modern warfare. Even if one high-level general or head of state is nominally in charge, he cannot be everywhere at once. Thus, unity of command is a pipe dream; subordinate commanders simply must make decisions on their own in some situations. Followed to its logical end point, the principle of unity of command would say that one general should actively command every unit, even down to the platoon level. While this is rapidly becoming technologically possible it will never be a good idea. As often as unity of command is preached by the U.S. military, it is countermanded by its own doctrine: joint operations are nominally commanded by a joint force commander but immediately below him are a joint land forces commander, a joint maritime forces commander, a joint special operations commander, and a joint air forces commander. There are simply too many active commanders in any modern military operation to ever expect true unity of command.

As for unity of effort, the components of a military force might all be working toward an overarching strategic goal but will rarely be working toward the same tactical goal. If they were, separate components would be

unnecessary. Each unit or type of unit will have its own mission based on its own capabilities, and it is up to the commander's staff to achieve unity through the plan and the necessary coordination that follows that plan.

The United States uses the word "objective" as a principle to capture the need to direct friendly military forces toward one overall goal, but this is so banal as to be unnecessary. The Canadian military "selection and maintenance of the aim" is wordier but not fundamentally different from objective.[3] It is also closer to the true goal of unity: that subordinate tactical plans and actions, although they are vastly different, should be aimed at the same strategic objective. The Canadian version also reminds us that tactical units must occasionally be refocused on their goal. In essence, all of these principles can be expressed by the word "unity": military force should be directed toward one goal under the command of one leader.

Economy

Two popular principles use the term *economy*: economy of force and economy of effort. There is a long-standing debate about the seeming contradiction between "economy" and "mass"; to be economical we should use only what forces and supplies are needed in order to accomplish the mission, but the principle of mass says that a concentration of effort is called for and that overwhelming force is the surest way to victory.

This seeming contradiction is, of course, the result of too many ideas being forced into the principles of war construct. Mass can help you win a fight, but no one ever won a fight by being more frugal with supplies.

Battles, future or otherwise, can be lost by running out of supplies, though. It is of course necessary to preserve enough supplies to continue to fight, to withstand counterattacks, and to carry you to the next fight. Here we see the conflicting interests of the commander and the staff officer, and it is their higher commander's burden to resolve the conflict. The staff must be cognizant of supplies and sustainability—the ability of the force to hold what they have gained and continue on.

Economy of force holds up better because it is nonsensical that you would have forces available but not use them to win. It is such nonsense that perhaps it does not need to be included at all. But economy of force does not mean that every friendly unit on the battlefield is fighting. We have

seen the importance of a reserve force that might never get into the fight. Additionally, reconnaissance units and sometimes lighter forces are effective at guarding or covering flanks or acting as exploitation forces; these are all necessary jobs. This is so natural for the commander that we do not need to include it.

It remains, however, for our principles of planning as the sustainability and resupply of the force that will win the battle is primarily their concern.

Time

Perhaps the most important aspect of planning that the staff must remember is time: the clock is ticking and the enemy is not getting any weaker as time passes. An oft-cited rule that staffs follow is called the "⅓–⅔ rule": Use ⅓ of the planning time for yourself and let your subordinate units use ⅔. However, although it is often cited, it is just as often ignored. High-level staffs can become so consumed in the myriad details and the presentation of plans to their commanders that they consume the opportunity to plan, then hand subordinate units an order too long to read. The need to give planning time to subordinate units is especially vital when utilizing mission tactics. If you are not going to tell your subordinates how to accomplish the mission, they need an opportunity to figure it out for themselves.

But there is not always time to plan, and staff especially must know that. In the U.S. military units do hundreds of training exercises a year. Such exercises are worthwhile but are almost entirely done in a static environment: the planners have good if not perfect intelligence and there is no opposing force making changes and trying to beat the clock and strike first. The gargantuan and complicated orders favored by the U.S. military are a luxury that it can afford in training, but rarely in combat.

Communication

There are many aspects to communication among the staff and between the staff and commanders, not all of which will be covered here. Communication is perhaps the most important principle of planning because each staff section—and sometimes each staff officer—offers a unique perspective that allows staff to look at the mission from every angle.

This is something few single humans can replicate as a commander. The most important aspect of communication is intra-staff communication.

A staff is akin to a think-tank that is intended to bring a number of experts together into one organized body. The basic staff has an administration section (S-1), an intelligence section (S-2), an operations section (S-3), a logistics section (S-4), and a communications section (S-6). Each is headed by an officer, the so-called actual, who is an expert in that field. Information and decisions from each section flow from there to the commander. The commander, however, should not be the one resolving conflicts between sections: that should be done by the staff itself and the chief of staff or executive officer.

This staff coordination or synchronization is vital and communication between each staff section is the only method by which a smooth plan can be produced. A plan that has been evaluated by each section and that each section believes in will be more easily approved by the commander and executed by the combat units themselves.

Conclusion

One of the problems with the principles of war paradigm discussed in chapter 1 was inappropriate principles that turned the original list into a bloated and unworkable intellectual construct. The principles of planning listed here are not inclusive, but these tactics for staff officers provide both a useful tool for planners and a way to alleviate the stress of an overstuffed tactician’s toolbox.

APPENDIX B

The Operational Level of War

There has been a long-running debate on the utility of the operational level of war the U.S. military adopted in the 1980s. It was "expected to facilitate the coordination necessary for multinational operations and to aid in connecting" tactics and strategy.[1] This has not occurred. One of the idea's most vocal critics, William F. Owen, has written, "The reason why the idea of an operational level of war is not fit for purpose is that it has attempted to create an artificial and flawed linkage between strategy and tactics. This had had two negative effects. First it has denigrated and marginalised tactics. Second it has undermined the correct understanding of strategy."[2] I believe that he is absolutely correct; this work is an attempt to correct that first effect.

The operational level of war is a creation of early Soviet military thought, and is usually attributed to A. A. Svechin.[3] The U.S. Army adopted it in the 1980s and the rest of the U.S. military followed suit.[4] It was meant to assist planners in connecting tactics with strategy, but it has done just the opposite. It is difficult to imagine how building a conceptual wall between the two ideas serves as a conduit. U.S. doctrine supposes that the operational commander, generally the corps commander and above, is doing something besides tactics. Readers of this book should, by this point, realize that the tactical tenets used when commanding a corps is much the same as those tenets used when commanding a platoon. Using maneuver and surprise to attack a line of communication is just that, whether it is

Operation Uranus involving millions of Soviet soldiers or an insurgent cell's ambush of a supply convoy in Afghanistan.

There has been no lack of scholarship that has pushed back against the idea of an operational level of war. In a 2009 paper written for the U.S. Army War College Strategic Studies Institute, Australian retired Brigadier Justin Kelly and Mike Brennan argued that not only is the idea lacking, but its existence in U.S. doctrine prevents useful thought and adroit execution of strategy.[5] They go on to say that while sequencing tactical action across time and space is necessary, that does not justify a new level of war. Stringing tactical actions together into groups across space and time does not alter their fundamental nature.

Still, tactical success is not enough in modern warfare. U.S. Naval War College professor Milan Vego has written, "Therefore, another field of study and practice must exist to properly orchestrate all available sources of military and nonmilitary power in order to accomplish the ultimate strategic or operational objective. This third component of military art (alternately called here operational art and operational warfare) occupies an intermediate position between policy and strategy on the one hand and tactics on the other."[6] Operational military art, then, covers the coordination and support of both numerous instances of tactical victories and other aspects of national power. For instance, cyber warfare can contribute to a strategic goal and to tactical victories, but conceptually it exists outside of tactical combat. Operational art can be used to coordinate cyber operations with tactical combat toward the strategic goal, for example. Where Vego errs, however, is in placing operational art between tactics and strategy. It is a contributing effort, but not necessarily a level of war.

The idea of operations thus has value, but as a level of war it is problematic. It encourages the idea that practitioners are doing tactics, or they are doing operations, or they are doing strategy. As we have seen, tacticians are doing tactics but also furthering (or detracting from) strategy; strategists can accomplish a strategy only by and through tactics. This is complicated enough without imagining that each actor is always doing tactics and operations and strategy. The operational level places a barrier between tactics and strategy and unnecessarily complicates an already complicated situation.

The idea does, however, have value as a descriptor of different methods or styles of warfare. It works better as a way to describe certain sets of tactics for certain strategic situations than it does as just an additional level between the Clausewitzian tactics–strategy dichotomy. For example, the term "counterinsurgency operations" describes the unique set of tactics chosen to combat an insurgency. For another example, the term "urban warfare operations" describes the unique set of tactics appropriate for fighting an enemy in urban terrain. In an ends-ways-means construct of strategy, the tactics are the means to achieve ends laid out by strategy, but a certain operational style is the way in which those tactics will be used. Tactics is deciding how to use the combat power available to defeat an opposing military force. However, other factors such as supply, logistics, communications, and other noncombat activities matter as much as—if not more than—fighting. Such activities can then be organized under operations—in other words, logistics operations, intelligence operations, and so forth.

The terms "operations" and "operational art" then provide us with an appropriate intellectual bin for actions that occur in warfare that support tactics and/or strategy but are not tactics or strategy in and of themselves. Examples include information operations, electronic warfare operations, cyber operations, logistics operations, and a myriad of other military and nonmilitary functions that are above and beyond the tactical system laid out here. These operations and functions, although outside the scope of this work, can have profound effects on the battlefield. Both the tactician and the strategist must be concerned with them.

Operational art was originally intended to resolve the "tension [that] exists between the abstract strategic objectives of the war and the mechanical tactical implementation of combat."[7] But, as we have seen, it also interjects an unnecessary and detrimental firewall between strategy and tactics when conceived as a level of war. In order to resolve that tension without unnecessary overcomplication, operational art should be viewed as an activity outside of the levels of war. Operational art, then, can be seen as the translation of strategic imperatives into tactical actions in the physical world. Operational art is more akin to what the staff officer does than what the tactician does. Operational art does not need to be a level of war for us

to understand in the sense of tailoring tactics to specific situations for specific strategic ends.

The debate surrounding the operational level of war revolves around two poles: one asserting it exists and the other that it does not. This work takes a middle road so as not to throw the operational art baby out with the operational level bathwater. I have omitted the operational level as a level of war so as to better highlight the vital connection between tactics and strategy, a connection that is all but severed by current U.S. military doctrine. Operational art, as the sustainment, support, sequencing, and linking of tactics in such a way as to achieve strategic effect, should remain. It should be seen, however, as segregated outside the levels of war and used only as a description of tactics of a common category (urban operations, for example) and as an activity wherein military staffs plan and organize tactics over a long period into campaigns. Numerous tactical actions planned over a longer timeline, however, are still in and of themselves tactics.

APPENDIX C

The Center of Gravity

The term "center of gravity" as a strategic concept is both a blessing and a burden. The term has the strongest of pedigrees in strategic studies because it originates in Clausewitz's *On War.* But the concept is perhaps his most tendentious one. It is widely used by policymakers and military leaders, who hotly debate its meaning. Some even recommend that use of the term should be severely restricted to limited circumstances.[1] But it is also one of his most compelling ideas. Clausewitz's description offers a tantalizing glimpse at a key to winning wars. At the same time, it seems he never truly grasped the concept. If he had lived to finish *On War,* much of the confusion surrounding the center of gravity might have been dispersed. Still, the importance of the concept cannot be denied. Clausewitz warned us, "The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish by that test the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into, something that is alien to its nature."[2] A strategic actor's center of gravity plays a large part in determining the kind of war he will fight. The concept is presented here both to ensure that tacticians are introduced to this strategic concept and to distinguish it from the doctrinal term used by the U.S. military. That doctrinal term is explicitly tactical and, in my opinion, incorrect.

One major source of misconceptions is Clausewitz himself. The term "center of gravity" is of course borrowed from physics. Thus, physics is the lens through which the concept has been evaluated time and time again. Basic physics, however, is insufficient. Objects on Earth behave the way

they do because they are subject to the gravity of Earth itself. A better paradigm with which to evaluate the concept is astrophysics. By virtue of existing in a vacuum, the physics of massive objects such as stars and planets provides a simpler and more sterile analogy. Key points from *On War* regarding the center of gravity include that it provides unity and cohesion to a strategic actor, much like a solar system's star provides unity and cohesion to all bodies that orbit it: its solar system. Yet the star does not exert complete control: the centripetal force of objects in orbit preserves a measure of freedom of movement for such objects and prevents them from falling into their star. A strategic center of gravity exerts control over tactical bodies—enforcing unity and cohesion—while allowing a measure of freedom. Strategy affects but cannot completely control tactical actions at bayonet range. Astrophysics is thus a better analogy than elementary physics in elucidating the center of gravity as a source of unity and cohesion that is essentially connected with the political aims of strategic actors.

Modern Use of the Center of Gravity

Two phrases have characterized American rhetoric surrounding the wars in Afghanistan and Iraq: "the people are the center of gravity" and "there is no military solution." The first is an oft-repeated encapsulation of *FM 3-24 Counterinsurgency,* the U.S. armed forces doctrine developed to address the insurgencies at a tactical level. It states, "Political power is the central issue in insurgencies and counterinsurgencies."[3] The logic behind the phrase is that an insurgency depends on the support of the people to continue its efforts; if that support is withheld, the insurgency will somehow wither and die. First, this does not address the possibility that the civilian population can be coerced into providing material and immaterial support to the insurgency. Second, the statement implies that material support to the insurgency is a function of the political support of the civilian population. Indeed, the purpose of any insurgency is to gain political power from another ruling regime (or to eject a third party that is exercising political control, such as was the case in many anticolonial insurgencies of the twentieth century). Contemporary commenters have echoed the rhetoric of government officials. In *Counterinsurgency,* David Kilcullen states, "The

center of gravity of an insurgent movement—the source of power from which it derives its morale, its physical strength, its freedom of action, and its will to act—is its connectivity with the local population in a given area."[4] Gen. Rupert Smith wrote, "I do advocate a revolution in our thinking, within the framework of war amongst the people: that our confrontations and conflicts must be understood as intertwined political and military events, and only in this way can they be resolved."[5] While technically correct that an insurgency is inherently political, so is all war and warfare. This marriage of politics and military force that expresses itself—in an insurgency—as a center of gravity among the people is neither new nor unique to irregular or insurgent warfare. It is a feature of war itself, and a necessary concept for strategy.

What makes the civilian population a center of gravity in the context of insurgency and counterinsurgency is solely its connection with the political aims of the opposing sides. The counterinsurgents want to retain political control and the insurgents want to acquire it. This leads directly to the second idea: that there is no military solution. This phrase is the result of a paradigm that insists that military and political spheres are mutually exclusive. As Clausewitz would tell us, this is absurd. War is political discourse with the admixture of violent (military) means, military and political spheres have a vital and intimate connection. The statement from *FM 3-24 Counterinsurgency* given above is meaningless as a descriptor of insurgency and counterinsurgency as political power is the central issue in all wars.[6] The population is a center of gravity not in and of itself but solely because political control of that population is the policy goal of both sides. In the context of an insurgency, military defeat of one side or the other detracts from the losing side's ability to preserve or gain the political power that is the animus behind the efforts of both insurgent and counterinsurgent. The corollary of "there is no military solution" is "we must find a political solution." A decisive military solution, however, is usually the necessary precondition of lasting political solutions.

A military decision, however, does not necessarily lead to a political solution. There are myriad examples of this fact but the most relevant is that of the war in Iraq in 2003. In the first phase of the war, the Coalition military forces achieved an unmitigated decision over the Saddam regime

and the Iraqi forces, dismantling and then disbanding the military, then occupying Baghdad. For a brief time, this military solution did lead to political control for the Coalition. They were, however, completely unprepared to assume that political control and the resulting vacuum allowed other groups to form and then compete for control. The defeat of the Iraqi army and the occupation of Baghdad, then, had at best a temporary effect on the center of gravity. This was because the means were not sufficiently aimed at the center of gravity (political control over Iraq) that had led to the insurgency.

The strategic center of gravity concept is thus a necessary idea. If correctly identified the opponent's center of gravity allows us to conceptualize the connection between military force as the means of strategy and the political aims that are the goal of strategy. This is so by virtue of its connection with the policies of the belligerents in any war. If, upon undertaking a war, we are to correctly understand its nature as Clausewitz warned, we must identify the center or centers of gravity. The strategy, as the link between tactics and policy, must be aimed at the center of gravity.

The failure on the part of the U.S. military to correctly identify enemy centers of gravity is the result of endemic doctrinal confusion surrounding the concept. This sickness then infects policymakers as the recipients of advice and recommendations from senior military leaders. In U.S. military doctrine, the center of gravity is defined as "the enemy's main fighting force."[7] This is a strictly tactical concept and not very useful for the strategist. As we shall see, Clausewitz did use the term in both tactical and strategic concepts, but the strategic concept of the center of gravity is not necessarily the enemy's fighting force or even a material entity at all. The U.S. military's definition of the concept then is not useful at the strategic level.

The effect of this doctrinal confusion is strategic drift and is evident by the misconceptions noted above regarding military and political solutions. This inaccurate conception about the strategic center of gravity concept prevents the linking of policy goals and the tactical means intended to achieve them. Without this vital forcing function, the United States has lurched from plan to plan without ever hitting its target in such a way as to

reach its end state. To better understand the center of gravity as it pertains to strategy, we must trace it back to its source.

Clausewitz on the Center of Gravity

The center of gravity concept as presented by Clausewitz can be separated into a few distinct elements. First, we must parse the tactical idea from the strategic. Clausewitz begins his discussion of the concept with a tactical conception of the idea. This first conception deals with the sphere of influence of a successful battle being related to "the size of the defeated force."[8] The bigger the victory the bigger the effect. Even the Prussian himself remarked on the banality of this idea. After a brief explanation of the center of gravity in physics, however, Clausewitz departs from the banal and begins to flesh out this kernel into a strategic idea.

From this point on Clausewitz departs from the purely physical conception of the center of gravity. He says that centers of gravity "will be found wherever the forces are most concentrated" but does not say that those concentrated forces are the center of gravity. He ascribes to the center of gravity the source of cohesion and a certain unity. A concentration of military power is the result of a center of gravity, and is not the center of gravity itself. An actor on the strategic defense will concentrate military force at points that are valuable to it, like a particularly valuable province, for example. Likewise, the actor on the strategic offense will concentrate military force to seize that province. That concentration is an indicator of a center of gravity but is not necessarily the center of gravity itself.

Further explication is found in the examples Clausewitz uses. He does use a belligerent's army as an example of a center of gravity, but he also lists many more. He says that cohesion is "frequently found only in mutual political interests" and that the center of gravity could be a belligerent's capital city, an ally with a large army, the shared interests of an alliance, and "personalities of the leaders and public opinion."[9] He did not limit the concept to a military force as does the U.S. military.

Finally, in his Book VIII, chapter 9, he states, "The task of reducing the sources of enemy strength to a single center of gravity will depend on: 1. The distribution of the enemy's political power" and "The situation in the

theater of war where the various armies are operating."[10] Again, the political nature of the center of gravity is evident and connected solely with a strategic actor's political power and its relation to the strategic situation.

What all of these examples have in common is the political aspect. The unity and cohesion of a belligerent arises from, and is intimately connected with, the political aim of the war. This is obvious when Clausewitz describes the political interest of an alliance as the sole source of its cohesion; even when he describes armies as centers of gravity, though, the armies he lists are closely linked with politics. His three examples of armies are those of Alexander the Great, Gustavus Adolphus, and Frederick the Great. All these are sovereigns who commanded in the field, not just great generals. Even Napoleon Bonaparte, another of Clausewitz's named examples, was himself a concentration of both military and political power. Since a center of gravity is that which gives a military force its cohesion and unity and sets it in opposition against another, a strategic center of gravity could be much more than just the examples set forth by Clausewitz. The cohesion of a military force could be the product not just of a sovereign leader or the need to defend a capital, but also the result of religion or ideology or even—in the case of mercenary armies—the result of money. Clausewitz mentions such possibilities very early in *On War,* in his Book I, chapter 2: "It is possible to increase the likelihood of success without defeating the enemy's forces. I refer to operations that have *direct political repercussions,* that are designed in the first place to disrupt the opposing alliance, or to paralyze it, that gain us new allies, favorably affect the political scene, etc." (emphasis in original).[11] Such actions that have "*direct political repercussions*" as he emphasized, are those that affect the center of gravity.

Current Thinking on the Center of Gravity

The debate surrounding the center of gravity revolves around what a center of gravity actually is. Most theorists seem to be searching for a standard, trying to decide whether it is a military force, a geographical location, a relevant population, or a military leader. What is consistent in all of the ideas that follow is the center of gravity's connection with politics.

Antulio Echevarria is clear on the matter that the center of gravity is not the army itself. He states, "First, the center of gravity concept only applies where a certain 'unity' (*Einheit*) and 'connectivity' or 'interdependence' (*Zusammenhang*) exist between the enemy's forces and the space they occupy."[12] This implies that the center of gravity is not the army or even the space that it occupies: it is the reason that an army is cohesive as a fighting unit in the field and the reason it is where it is. This can only be the existence of that army as a servant of a political force and the aim of that political force when it comes to the ground it occupies. An army is not formed and then stationed on a country's border in and of its own accord. It is formed to serve that country and that country's border is defined by a political entity. The center of gravity then is connected to the political aim that brought that army to that piece of land.

Hew Strachan's view of the center of gravity brings us a little closer to the concept. According to Strachan, "What now preoccupied him [Clausewitz] was the relationship between the theatre of war and the armies operating within it. Consistent with his rejection of Bülow, he was not prepared to see geography itself as possessing a centre of gravity: key points in the terrain gained their significance not in themselves but from the troops which occupied them, and thus the 'real key to an enemy's country is usually his army.'"[13] This is still not satisfying, however, as Clausewitz's center of gravity draws forces to it. If the forces themselves create the center of gravity, what is drawing them to the point? Again, our only answer can be the political goal. Take, for example, the British and French effort to seize control of the Suez Canal from Egypt in 1955. The canal did not become a center of gravity in the conflict because of the forces sent there nor the fact that it was a canal. It became a center of gravity once Egypt asserted its political control in a way unsatisfying to England and France. The canal then drew forces to itself because the political aim of all the strategic belligerents was control of the canal. The end of the crisis came when the center of gravity was struck in an unexpected way: President Eisenhower decided to back Egypt's claim, thus making the political goal of England and France a far more expensive prospect than they had believed. The political aim of each belligerent imbued the Suez Canal with status as a center of gravity during the crisis.

Jon Sumida also identifies the political goal as the key ingredient in the center of gravity. Sumida noticed that, when discussing guerilla warfare, Clausewitz identified the center of gravity as "the personalities of the leaders and public opinion" as noted above.[14] According to Sumida, "Here Clausewitz makes it clear that the center of gravity of a defender waging guerilla war is political rather than military, and as such insusceptible to destruction by concentrated military force alone."[15] But is this any different for the conventional army of a defender? If the political aim of the defender is not resistance, there is no reason for the conventional army to resist. As unlikely a scenario as this is, there is still an example. On 15 March 1939 Hitler's Germany invaded what remained of the already dismembered Czechoslovakia. Rather than resist the invasion, the Czech government capitulated immediately—albeit under duress. The presence of the Czech conventional army was not in and of itself enough of a center of gravity to produce resistance; in fact, a resistance needed to be predicated on the political aim of the Czech government to maintain independence—or at least to fight for it.

Sumida also sees this connection between political aim and the center of gravity: "Clausewitz made clear in Book VI that decisions are not deferred because of physical military factors but because the attacker lacks the will to act. The attacker's lack of will, in turn, is the product of political considerations."[16] In the case of Czechoslovakia, it was the defender that lacked the political will to create a center of gravity.

In *The Strategy Bridge* Colin S. Gray lays out strategic effect as a key concept in strategy. Since Clausewitz believes that the most effective blows are those aimed at the center of gravity, it follows that the best way to produce strategic effect is to direct tactical efforts toward it. Gray states, "Battle is truly decisive beyond the narrowest of military confines only when it is the enabling agent for strategic decision."[17] For battle to become that enabling agent of strategic effect, it must be aimed at a strategically vital point, the center of gravity. Thus the center of gravity can act as a forcing function to coordinate the efforts of various tactical actors because (1) it is where tactical blows can produce strategic effect and (2) the political aim of the opponent determines the center of gravity. The center of

gravity then assists the strategist in deciding where along the river the strategy bridge should be placed—that point on the enemy shore where, once reached, the most strategic effect on the enemy can be produced.

Sir Lawrence Freedman provides another view of the same dynamic in *Strategy: A History:* "This [achieving victory] required tracing back the 'ultimate substance' of enemy strength to its source and then directing the attack against this source. The target might not be a concentration of physical strength but possibly the point where enemy forces connected and were given direction. Any disruption would maximize effects beyond the immediate point to the larger whole." Freedman uses Clausewitz's example of an alliance to explore this dynamic and, like Gray, implies that it is the "unity of political purpose" that is the center of gravity of alliance.[18] Thus we see again that political aim and the center of gravity are connected. Indeed, even when a strategic belligerent is not an alliance, it is the political aim that infuses military forces with purpose and will. An army, removed from its purpose of serving a political master of one kind or another, will not offer any coordinated resistance to an opponent thus imbued. During the Arab conquest of the Sassanid Empire in the seventh century AD, Sassanid armies made separate peace arrangements with the Arab invaders once the king, Yazdegerd III, had fled the capital.[19] Their political purpose—defense of their king—was removed with the king himself and thus they lost their connection with the state.

Peter Paret, in his essay on Clausewitz in *Makers of Modern Strategy,* states the idea in stark terms: "The political purpose for which a war is fought should determine the means that are employed and the kind and degree of effort required. *The political purpose should also determine the military objective*" (emphasis mine).[20] We are even closer to a conclusion. Since the political purpose determines military objectives and military objectives will determine concentration of military forces, it follows that the nature of the political purpose will also determine the nature of the center of gravity.

These modern ideas on the center of gravity echo U.S. Navy admiral J. C. Wylie's criticism of Clausewitz. Wylie believed that a Clausewitzian viewpoint was solely focused on the destruction of the enemy army. He used two examples where a nation was defeated while a majority of the

army remained in existence: the Pacific War in 1945 where Japan had significant ground forces remaining in Manchuria, and the Battle of Dien Bien Phu in 1954 that precipitated the defeat of the French even though only a portion of its army was defeated.[21] A third example is the 1968 Tet Offensive during the U.S. involvement in Vietnam. The NVA achieved no tactical objectives, caused very few U.S. casualties, and suffered massive casualties of its own. The Viet Cong were almost wiped out. Yet the offensive was a strategic success because the very fact that the communists could mount such an effort clashed with the American government's rosy narrative of success in the country. The Tet Offensive was a success because it struck at the political goals of the United States through a center of gravity: the American populations' perceptions of success or failure and their trust in the leadership of President Lyndon B. Johnson.

Finally, the pithy Sun Tzu implies that a center of gravity is something beyond the tactical and physical. He states, "When I wish to give battle, my enemy, even though protected by high walls and deep moats, cannot help but engage me, for I attack a position he must succor."[22] Even if the enemy in this example enjoys great tactical advantages, his opponent gains some measure of control over him by attacking a strategic center of gravity—his base of political support perhaps—thus forcing him to abandon his plan and follow one designed by his opponent.

To summarize all of these ideas, it is clear that the center of gravity of each opponent is interdependent with the political aim of each opponent. An opponent's center of gravity is underpinned by the will of the opponent to achieve it (or deny it to the opponent); thus striking the center of gravity is the surest means to deplete or shatter the enemy's will. Identifying it and exploiting it, such as in Sun Tzu's vignette, can grant one side an advantage: the initiative or even strategic leverage. Thus it is not physical or tactical, although tactical action and physical aspects of war can be imbued with strategic effect by the potential harm done to the opponent's aims. To return to the example of the Suez Canal crisis, the will of the British and French was shattered by President Eisenhower's political decision not to support their cause. This was a very direct strike on the center of gravity.

Physics vs. Astrophysics

If so many experts agree on the nature of the center of gravity as a component of the political aims of the opponents and its nonphysical nature, then why is there still so much confusion about the concept? This is a continuing and unfortunate effect of the term's origin in physics and the limitations of the science of Clausewitz's day. Because the Prussian had only a limited grasp of physics, due to the training and limitations of science in the early nineteenth century, he did not have the tools to fully flesh out the analogy. Today, however, we do have the tools. The first step is to remove the concept from basic physics and instead examine it through the lens of astrophysics.

Clausewitz's Physics

It is thought that Clausewitz drew much of his thinking on physics from the lectures of German physicist Paul Erman, who taught at both the University of Berlin and the Prussian war college.[23] As director of the war college, Clausewitz and Erman were colleagues. Still, Clausewitz was limited to the physics of his time. We still look at the center of gravity through a lens of elementary physics. In his article for the *Naval War College Review,* Antulio Echevarria applied these physics to the concept to argue that it is not a source of strength but rather of weakness.[24] He uses examples such as boomerangs, marbles, sticks, and the human body. All of these examples do have centers of gravity, but they cannot serve as effective examples when they are always subject to a far more powerful one—that of the Earth's gravity. The scale of these examples is too small to adequately flesh out the concept. It makes more sense when the examples are as large as planets. Or stars.

Astrophysics

The center of gravity analogy makes more sense when evaluated on a large scale where every object is regular enough in shape so that the center of gravity actually is at the center but the objects move independently. The only way to do that is to look at the physics on a galactic level. The scale of

a solar system allows us to demonstrate how mass and gravity interact in the absence of extraneous forces such as the friction of atmosphere.

In a solar system it is the object with the greatest mass that gives the system as a whole cohesion and unity and—through light—animates it as a system. A star, having far greater mass than planets and other objects, holds each of those nearby objects in an orbit. Centrifugal force, however, offsets the gravitational pull of the star, allowing the planets, satellites, or moons a measure of freedom (i.e., not falling into the star) while still chaining the object in place. Additionally, each planet has its own gravitational force so that some objects, like moons, orbit planets and not the star. Moreover, there are many types of stars and other objects, such as black holes, with centers of gravity that exert force on other objects.

Since war is a dynamic interaction between two or more combatants, each with its own center of gravity, we must take the analogy farther and imagine the collision of two solar systems. In this catastrophic event, one would displace the other (which would then most likely be subsumed). If one solar system's planet hits the planet of another, knocking it out of orbit, this would certainly damage the solar system. But if one solar system is "hit in the star," the impact would affect the entire solar system. The displacement of one star would pull all of its planets along with it.

This intergalactic billiard ball game would not occur in reality: the gravity from the colliding stars would either fling each star away from each other or the two stars would join together. But it can help us illuminate the concept of the center of gravity.

The star's center of gravity gives the solar system unity and cohesion by holding each orbiting object in place while allowing those objects (through centrifugal force) a measure of freedom. A center of gravity in war provides the same function. Take Clausewitz's favorite example, Napoleon Bonaparte. As emperor, Napoleon gave postrevolutionary France cohesion and unity. He decided on the political aims for which all of France strove while under his reign. He held his corps commanders in orbit, but allowed them freedom within his designs. The divisions under a general's command are analogous to moons or other satellites. Napoleon, however, also controlled other aspects of French power: the navy, economic measures, and diplomatic means. These disparate means were, again, given cohesion by the emperor himself.

Of course, Napoleon was also a commander-in-chief who led his armies personally. In this case, the French center of gravity was found with the army, usually the largest one. It was not the mass of large numbers of troops that provided the unity and cohesion to French efforts, however. Rather, it was the political mass of Napoleon as a brilliant tactician, emperor of France, and commander-in-chief that brought those large numbers of troops to a time and place of concentration. From the front, he sent orders back to France in attempts to manage economic concerns. He also acted as chief diplomat on numerous occasions, all while commanding the army. He cannot be seen solely as a military force.

To use a more modern example, the armed forces of the United States do not give unity and cohesion to a war effort in and of themselves. The unity and cohesion of the U.S. military derives from loyalty and service to the government of the United States, embodied in the constitutional power of the president as commander-in-chief. Geographic combatant commanders orbit this embodiment and have both a great deal of power and great limitations put on that power. Political aims and authority provide the underlying cohesion and unity. Loyalty to that polity animates the actions of every actor in the system. One need only imagine the reaction of America to a credible threat to its Constitution to test this idea in action. This concept can be applied just as well to a nonstate entity: it is the political goals of such an entity that both animate and unify it even if that cohesion is weak. The density and thus the gravity of a still-forming star—a protostar—is weak as well. The militaries of newly formed countries usually have a weak connection with the country as an idea.

In *Verdict of Battle: The Law of Victory and the Making of Modern War,* Yale University law professor James Q. Whitman searches for a reason why battles are decisive, settling on international legal frameworks of varying degrees of codification. His gold standard for such a framework is the eighteenth century, but even then not all battles were decisive. The Battle of the Monongahela in 1755, to take one example right from the middle, was tactically decisive but not strategically so; General Braddock lost the battle to seize Fort Duquesne from the French in unquestionable style but Britain went on to win the war. The loss of two regiments and one impetuous general did not strategically wound Great Britain. Nor did France gain any strategic effect through its possession of Fort Duquesne.

The Battle of Yorktown a few decades later was decisive in another war. Again, Great Britain lost an army and, this time, a competent general. But that is not why Yorktown was decisive. It was decisive because the British ability to shore up Loyalist sentiment in the southern colonies, thereby regaining political control, was now gone. The southern colonies were a center of gravity because the perceived loyalism of its inhabitants and its connection with Great Britain's policy—retention of the American colonies as colonies—imbued the verdict of Yorktown with decisive strategic effect. To use Whitman's own exemplar, Frederick the Great's seizure of Silesia in 1740, the center of gravity was Silesia itself only because control over it was the policy goal of both Prussia and Austria. Frederick's victories at Mollwitz in 1741 and Chotusitz (Czeslau) in 1742 were decisive because they destroyed Austria's will to continue to contest the region through force of arms and preserved Frederick's ability to assert control over Silesia via his military. International law had little or nothing to do with the decisiveness of Frederick's victories. Political will did.

To address the matter of whether an army in and of itself can be a center of gravity, the answer is that it depends. In some cases, the destruction of an army can be enough of a shock to the political system that political aims are changed or abandoned. Dien Bien Phu is one example.

Another example is the Battle of Sphacteria in 425 BC. When the Athenians captured 292 Spartans on the island of Sphacteria, Spartan hoplites were so few and so difficult for Sparta to produce that their capture immediately induced Sparta to seek terms with Athens. This is not, however, always the case. The destruction of the massive Roman army at Cannae by Hannibal in 216 BC was not enough of a shock to the Roman political system to produce defeat. It did cause the defection of some Roman allies, but the shock of the loss of its army galvanized Rome itself. The gravitational force of Rome provided such strong cohesion and unity to Roman citizens that the destruction of entire legions was not enough to shatter it.

Wylie's Coup

Although the strategic center of gravity concept is the progeny of Clausewitz, it is Adm. J. C. Wylie's conception that is more useful. In

chapter 8 of *Military Strategy: A General Theory of Power Control,* Admiral Wylie made the center of gravity the center piece of his general theory of strategy. Wylie described the center of gravity as "not limited to a geographic connotation," but that "it must be a point at which the opponent is more than casually sensitive. Ideally, it should be some kind of national jugular vein. At the least it should be in some sense neuralgic and one that will loom large enough in the opponent's structure to force accommodation to the strategist's own pattern in the manipulation of control."[25] Wylie's conception meshes well with Clausewitz's view of war as the contest of two wrestlers. Both thinkers viewed the center of gravity both as a strength and as a vulnerability.

Such a point can only be connected to a vital political interest of the actor in question. This is evident in the examples that Wylie uses to illustrate the concept. The first is Scipio's strategy against Hannibal in the Second Punic War. Scipio first undermined and destroyed Carthaginian political control of Spain, and then attacked Carthage itself, the political capital that Hannibal could not help but defend. Wylie's second example is Sherman's March to the Sea during the Civil War. Wylie said that the political pressure on the Confederacy wrought by Sherman contributed more to the end of the war than Grant's defeat of Lee's Army of Virginia.[26] (Wylie credits Sherman for this idea but the grand conception was Grant's.)

The center of gravity, then, is something that is tangible or intangible that provides a strategic actor with both cohesion and unity as a political unit. Thus, if the center of gravity is targeted, its possession can be used to control, modify, or deplete the opponent's will to pursue the conflict. It is something so important to the very identity and goals of a strategic actor that they will go to great efforts to secure or obtain it. The center of gravity, like the star of a solar system, pulls mass to itself but also sustains the life and animation resident in that mass. To understand the concept further, we turn to a center of gravity that developed from perhaps the most massive and destructive strategic collision in history: the Battle of Stalingrad.

Stalingrad

There was no military or strategic reason for Stalingrad to become a center of gravity on the Eastern Front during World War II. Its munitions factories were a fraction of the Soviet industrial capacity, much of which had been moved much farther east. It was a small city in comparison to cities like Petrograd and Moscow. It boasted no significant part of the Soviet political apparatus, which was concentrated in Moscow itself. Initially, Hitler did not even want it captured.[27] It was solely a symbol by virtue of its name, one imbued with political import only because of the two dictators, whose regimes were built on symbolism, who would vie for control of it and consume hundreds of thousands of lives in the process.

By the spring of 1942 Adolf Hitler's grand plan to smash the Soviet Union in a lightning campaign had clearly bogged down. Moscow had barely been saved by the strenuous efforts of the Red Army and the Russian winter. In April of that year Hitler released his directive for the coming summer campaign, convinced that Soviet reserves had been completely depleted. Stalingrad had not been an objective of the Nazi war effort until this point. Operation Blue, Hitler's grand plan to win the war, added it and mandated a concentrated effort not toward Moscow, but toward the south, with objectives to seize Stalingrad and the Caucasus oil fields.[28] Most German generals disagreed, recognizing Stalingrad as a strategic backwater. By this time, however, Hitler had consolidated control over the entire war.

Hitler's fascination with Stalingrad was born solely from its name. At a conference with senior generals on 1 June 1942, Hitler was interested only in destroying Stalingrad's armaments factories and reaching the Volga River, but not in capturing the city itself. By July, however, Hitler had changed his mind. Operation Blue was retooled and he now ordered the Sixth Army to seize the city.[29]

Stalin, for his part, was keenly aware of the symbolism of his namesake city and the necessity for his political power of retaining it. He ordered three armies of his strategic reserve freshly arrived from Siberia to the city.[30] At this point, the coming battle had become "a collision between the personal wills of the two dictators."[31]

Even before the Sixth Army reached the city, Stalingrad exerted its gravitational pull on the Nazi war effort. In late July Hitler pulled the Fourth Panzer Army from the Caucasus offensive to support Colonel General Freidrich Paulus, commander of the Sixth Army. In August that offensive bogged down because of a lack of fuel and other supplies, reserves of which were now being funneled to the Sixth Army. In September, "almost all available Luftwaffe was diverted to Stalingrad."[32] Stalingrad had become a center of gravity for both Hitler and Stalin—whether they realized it or not—and it was exerting control over entities around it, pulling men, materiel, and moral force into its orbit.

The massive amount of combat power devoted by Hitler to the seizure of Stalingrad was nearly successful, despite Stalin's commitment of reserves. At one point, Sixth Army troops were within 100 meters of the shore of the Volga River. Although the Germans were overstretched strategically, the tactical excellence of the Wehrmacht, along with callous Soviet disregard for casualties, still showed in Stalingrad. The Luftwaffe opened the attack with fully 600 aircraft, turning Stalingrad into a gutted skeleton of a city in a matter of weeks.[33] The first German ground offensive into this corpse occurred on 13 September. Stalingrad, squeezed between German panzers to the west and the Volga River to the east, became a virtual prison after Stalin's "not one step back" order. Nearly 200,000 civilians were conscripted into the defense in one service or another. On 8 November Hitler gave a widely distributed speech that both promised to the German people the capture of Stalingrad and explicitly stated that it was an objective not just because of its name.[34] It is difficult to see why else he would so stridently insist on its capture against the objections of his generals because the city existed only as a battlefield after the Luftwaffe's destruction. Even so, by making the promise Hitler had now sentenced his troops to stay in Stalingrad until the end.

Despite the amount of resources the Germans threw at the city, the tenacious Soviet defense held the Sixth Army to a virtual standstill by November. At this point, the Soviets launched two major assaults against the forces of Germany. The first, Operation Mars, involved 667,000 Red Army troops and 1,900 tanks in a failed attempt to encircle the German

Ninth Army. Around 100,000 Soviet troops were killed.[35] Stalingrad's gravity distorts even the history of the conflict. Operation Mars is barely remembered today, despite its massive size.

Better remembered is Operation Uranus, the Russian encirclement of Stalingrad and the Sixth Army itself. Massive Soviet offensives against Romanian army troops guarding Paulus' flanks collapsed Axis lines in a giant double envelopment. About 200,000 German troops were trapped within Stalingrad. German armies had broken out of such encirclements on the Eastern Front before, but this time the political import of Stalingrad intervened and Hitler personally ordered no attempt to break out. A relieving force commanded by German general Erich von Manstein failed to reach the beleaguered Sixth Army in late December. The Luftwaffe could not generate enough sorties, due to weather and lack of aircraft, to supply the starving Sixth Army. Even symbolic efforts like Hitler's promotion of Paulus to field marshal were not enough to save the trapped troops. Paulus surrendered on 31 January.[36]

The casualty numbers demonstrate exactly how much effort was sucked into Stalingrad's maw. Around 240,000 Russians died and 320,000 sick or wounded were evacuated. With civilian deaths added in, the number rises to 600,000.[37] Of the 10,000 members of one Soviet division, the 13th Guards Rifle Division, only 320 lived to see the end of the battle.[38] The German Sixth Army ceased to exist. The Luftwaffe's attempts to supply the Sixth Army once it was trapped cost it 495 aircraft of various types. Around 147,000 Germans and Romanians died; of the 91,000 that were captured, only 5,000 survived to the end of the war.[39]

The Battle of Stalingrad was decisive not because its possession conferred any particular advantage to either side. Indeed, Stalin's physical prize was only the ruins of what had once been a city. Nor was it decisive because of the loss of the Sixth Army: Germany retained significant combat power after January 1943. It was decisive solely because it was so connected to the aims—one could say needs—of Adolf Hitler and Joseph Stalin. It was a center of gravity because of this connection with political power. Its status as a center of gravity, in turn, made the result of the battle decisive.

What the story of Stalingrad demonstrates is a stark example of a center of gravity. The battle is widely recognized as a decisive turning point, and it certainly was. But the reason it was decisive was not the physical loss of the Sixth Army to the Germans and the physical retention of the city to the Soviets, but rather the moral effect on both sides. Despite prodigious efforts to hide the defeat, it became much more difficult for Nazi Germany to project the appearance of success from January 1943 on. Since Stalingrad had become a center of gravity, Stalin's denial of it to Hitler struck a devastating blow, threatening the very unity and cohesion of Nazi Germany. The victory at Stalingrad boosted the morale of the Red Army to a great degree. These effects were decisive because of the political meaning of a city named for Stalin and Hitler's failure to seize it.

The core of the strategic center of gravity is its connection to the political aim of strategic actors. It is what provides unity and cohesion to a strategic effort, for better or for worse. As seen in Stalingrad, the political import of the city made it a center of gravity that then pulled resources to it. Hitler siphoned off materiel and troops from elsewhere on the Eastern Front in order to capture it, which had dire effects for the war effort as a whole. Stalin did the same, but the Soviet Union was in possession of far more reserves than Nazi Germany. Because politics imbued Stalingrad with such gravitational force, its denial to Hitler produced negative strategic effect just as its retention produced positive strategic effects for Stalin in the form of boosted morale and confidence. The feeling of inevitability of Nazi victory was first pierced by the Red Army at Stalingrad, and the end of that feeling became decisive precisely because of its connection with political aims. Whether a center of gravity is identified in the midst of a gargantuan clash of nations or within the context of a small-scale insurgency, the political import is the core idea. If, as Colin Gray says, strategic effect is the goal of strategy, efforts to strike, seize, defend, or retain the center of gravity is the surest and most effective way to achieve it.[40]

Conclusion

The great value of *On War* is that it offers the best framework, thus far, for how to think about war. It was not intended to teach us how to win a war. In the center of gravity, however, is where the Prussian came closest to such a

provision. If you can accurately identify a center of gravity, you have done a large part of making that first, supreme, most far-reaching judgment. Indeed, Clausewitz states that this first and most comprehensive of all strategic questions "will be given detailed study later, in the chapter on war plans."[41] This is the very place that includes his most detailed description of the center of gravity.

Shifting the scientific analogy of the center of gravity to astrophysics helps to elucidate the concept. War is perhaps the most massive human phenomenon in terms of destruction, change, and, in extremely rare cases, progress. As a political force, a center of gravity is both subject to the gravity of political power and can exert political power on its own. Simultaneously, it is a unifying and cohesive force and possessor of gravitational force of its own. The Battle of Stalingrad's scale in both tragedy and sheer mass makes it an ideal case study of the political aims of two giants of political power as they clashed over one unfortunate city.

The center of gravity is a vital concept for the strategist, but it is also important for the tactician. If the enemy's center of gravity is correctly identified and then transmitted to the tacticians that must carry out the strategy on the ground, it will allow them to prioritize their actions, aim their moves, and modify their plans in support of the strategy, without need for detailed strategic guidance. Likewise, the tactician must know what friendly centers of gravity are vital to defend and, sometimes, what need not be defended in favor of something else.

Like the galaxy itself, war and warfare have an almost infinite number of permutations and variations. We cannot restrict the center of gravity to only armed forces or only capital cities, or to kings or emperors or generals. The center of gravity of every war is unique and can only be identified by examining the political aims of both belligerents: it is through the political connection with the center of gravity we can ascertain what tangible and intangible points can be assailed to gain leverage over those political aims. Strategy and tactics will properly flow from this identification because it can act as a unifying and cohesive force to synchronize and guide the strategic effort. Proper identification of both the center of gravity as a concept and the strategic center of gravity of a potential war is the core of

Clausewitz's prescient warning to understand the kind of war on which a country or state intends to embark, and the ultimate test of strategy.

The United States has failed this test twice so far in the twenty-first century. Identification of the political control of the civilian population as an important center of gravity came too late, after the expenditure of far too much blood; any blood spilled in the pursuit of a fallacious strategy is too much. Even once it was identified, American military doctrine shows little understanding of why it is so, and persists in explaining counterinsurgency as somehow uniquely political. This betrays a dangerous misunderstanding both of insurgencies and of conventional state-on-state war, as if the latter is apolitical. The continued conflation of the tactical center of gravity with the strategic is not just semantics: troops pay for such mistakes with their lives.

APPENDIX D

Conventional vs. Guerilla Warfare

A battle is won by him who is firmly resolved to win it.

—Leo Tolstoy, *War and Peace*

While the rest of this work leans heavily on examples drawn from conventional tactics instead of guerrilla or irregular tactics, it should be obvious that within this tactical system the difference is not very useful.[1] Irregular tactics are just tactics with a preference for maneuver, tempo, deception, and surprise in order to compensate for a lack of firepower, mass, and shock. Whether the tactician is a uniformed soldier or a farmer turned fighter, he will use what tactics he can to achieve victory.

Where the difference is important, though, is at the strategic level as the strategy will have profound effects on the tactics chosen. Since strategy can only be secured through the use of tactics, the nature of that strategy will determine what form those tactics will take. This is important because the conventional versus irregular divide is confusing for military forces. In the words of Hew Strachan, "The binary vision of war has the effect of pulling armed forces apart, not providing coherence."[2] Most leaders of professional military forces believe that they must choose to train for either conventional war or train for irregular war. This is a false choice; they must train to be tactically proficient and then examine the strategic environment for what tactics will be necessary. Flexibility and adaptability are the keys to success because tactical principles remain the same whether the combatants are professional forces or part-time guerrillas, even though every military force will emphasize different principles based on that force's particular strengths

and weaknesses. The binary vision of war is a relic of past theories. This phenomenon was, unsurprisingly, detected by a young Carl von Clausewitz who taught Prussian war academy students that skirmishers and conventional troops would need to use each other's methods.[3] This predicted convergence is now long-established fact and only theory has lagged behind.

This appendix will explore the real difference between conventional and irregular warfare by drawing out the differences at the strategic level that guide the tactics employed, thus building on the conclusion that tactics are not materially different at the bayonet level.[4] It will do so through a serious of dichotomous views of different forms of strategy: the offense-defense paradigm of Carl von Clausewitz, the annihilation-exhaustion paradigm of Hans Delbrück, and the sequential-cumulative paradigm of J. C. Wylie. There are other views, but these three pairs effectively highlight the differences between conventional and irregular combatants at the strategic level. Of course, none of these pairs is mutually exclusive. Each exists on a spectrum; I use them here simply as analytical devices.

Clausewitz: Strategic Offense vs. Strategic Defense

At both the strategic and tactical levels, Clausewitz saw a dichotomy between the offense and the defense.[5] He mostly associated offense with invasion of another country and defense with ejecting such an invasion. In the context of insurgency/counterinsurgency, however, the two opposites do not neatly map onto counterinsurgent or insurgent. Third-party counterinsurgents are clearly on the strategic offensive, but the beleaguered indigenous government might be on the strategic defensive. They have a negative aim (preserve political power) but also a positive one (gain control that has been lost due to the existence of an insurgency). Insurgents have a positive aim (political control of the country or area in dispute) but typically enjoy the benefits of the strategic defense: local knowledge and support. Conversely, insurgents also have a negative aim: the preservation of their ability to affect the political situation with violence or the threat thereof. Additionally, the insurgency gains benefit from the passage of time because their existence reduces the legitimacy of the counterinsurgent: in

Clausewitz's words, "He reaps where he did not sow."[6] It is useful for our purposes, then, to place the counterinsurgents on the strategic offensive and the insurgents on the strategic defensive even though both combatants exhibit the traits of both opposites.

The benefits gained by the insurgents from the strategic defense are myriad. Firstly, the defense is the stronger form of war, granting a resiliency belied by the insurgents' typically low potential combat power. Insurgents also gain strategic currency not only by their own actions but by the action or inaction of the counterinsurgents. For example, the insurgency in Iraq gained benefit from the release of pictures of U.S. soldiers abusing detainees in Abu Ghraib Prison. Clausewitz also described the benefits gained from the population: "Every kind of friction is reduced, and every source of supply is nearer and more abundant."[7]

Meanwhile, the counterinsurgents seem more hamstrung than emboldened by the difficulties of the strategic offensive. The point of culmination is the main threat: "This culminating point of victory is bound to recur in every future war in which the destruction of the enemy cannot be the military aim."[8] Since an insurgency can rarely be defeated by the complete attrition of all of its adherents, the counterinsurgents will at some time reach a point beyond which they cannot invest enough resources to achieve a decision. Time works against the counterinsurgent both in the sense that it is a limited resource and the passing of time benefits the insurgent rather than his opponent.

The Vietnam War demonstrates this dynamic. The United States seemed to be on the strategic offense: they were invested in a country far from their borders with deployed military force. The aim, however, was negative: preserve South Vietnam from North Vietnamese aggression and internal communist insurgents, thus stopping the spread of communism. Additionally, the United States willfully renounced the typical initiative and tools of the strategic offense. Ground combat troops never invaded North Vietnam for fear that China or Russia would be drawn farther into the war. The curious strategic choices of the United States thus stripped the strategic offense of its major benefit, decisiveness, while retaining its greatest weakness, the point of culmination. Unsurprisingly, the North Vietnamese

exploited this fact and, despite a massive advantage in tactical action that favored the U.S. military, the United States withdrew.

Hans Delbrück: Attrition vs. Annihilation

In the *History of the Art of War,* Hans Delbrück also divided military strategy into a dichotomy: *Niederwerfungsstrategie* and *Ermattungsstrategie*. *Niederwerfungsstrategie*, or annihilation, was described as a strategy in which the "sole aim is decisive battle."[9] It is typified by Napoleon's methods: find the enemy force and destroy it, preferably in a single large battle. *Ermattungsstrategie*, or exhaustion, is its opposite: focused on outlasting the enemy through economy of force and the gradual accumulation of small tactical actions. Exhaustion is classically illustrated by the strategy proposed by Fabius where Rome would avoid fighting a large battle with Hannibal's army and instead focus on eating away at his outposts. Battles still occur, but one combatant avoids exposing the entirety of, or a preponderance of, his forces to destruction by the enemy's forces.

An exhaustion strategy puts a premium on economy of force, preserving your combat power while slowly reducing the combat power of your opponent. This in turns drives tactical actors to place a premium on dispersion, ambuscades, hit-and-run attacks, camouflage, and choosing smaller enemy forces to target. A strategy of annihilation, on the other hand, encourages rolling the die on large-scale battles where the enemy army might be destroyed entirely.

The best exemplar of Delbrück's dichotomy is Napoleon's Russian campaign. Napoleon stuck with his strength: annihilation. The Russians, quite accidentally, chose a strategy of exhaustion. General Kutozov avoided large-scale battle when possible, and even Borodino was defensive in nature. Lacking the chance to destroy the enemy army, Napoleon tried the next best target: Moscow. Exhaustion, through lack of supplies, forced Napoleon to abandon Moscow; the combination of the Russian winter and irregular Cossack attacks drove home the point. Napoleon's attrition strategy had achieved its objectives: win a large battle and seize Moscow. But in pursuing his strategy Napoleon failed to contest the exhaustive strategy of the Russians. He overextended his already weak supply lines

and expended his combat power to achieve goals in a game the Russians were not playing. It is important to note that while Russia pursued a strategy of exhaustion, it was not entirely irregular in nature. Their strategy drove a tactical scheme that was more defensive and economical, but the Russian army still used so-called conventional tactics, especially at Borodino.

J. C. Wylie: Sequential vs. Cumulative

While Clausewitz viewed strategies as differentiated by aim and Delbrück by method, Rear Adm. J. C. Wylie saw a dichotomy based on time. In *Military Strategy,* Wylie described a sequential strategy as, "a series of discrete steps or actions, with each of this series of actions growing naturally out of, and dependent on, the one that preceded it." Tactical actions are planned in a systematic manner from beginning to end. A cumulative strategy, however, does not utilize a planned process but rather uses disconnected tactical actions that eventually overwhelm the opponent's will. "The entire pattern is made up of a collection of lesser actions, but these lesser or individual actions are not sequentially interdependent. Each individual one is no more than a single statistic, an isolated plus or minus, in arriving at the final result."[10]

In this case as well, it is easy to see how the strategy drives the tactical pattern. A sequential strategy virtually requires centralized planning, command, and control while a cumulative strategy is best executed by military forces operating in a decentralized manner. Large-scale battles are not necessary for a combatant pursuing a cumulative strategy and thus are not worth the risk of concentrating combat power. Conventional militaries, with their strict hierarchical command-and-control structures and prescriptive, doctrinal planning processes, are ill-equipped to comprehend, much less combat, a cumulative strategy. In Lukas Milevski's words, "The linear logic of sequential strategy collapses in the face of cumulative strategy."[11] On the other hand, a disparate collection of loosely allied insurgent groups—such as the insurgency in Afghanistan—cannot help but execute a cumulative strategy, and is ideally structured to do so.

The insurgency in Afghanistan is composed of a patchwork of groups ranging from local strongmen simply seeking to maintain local autonomy, to criminal organizations, to the actual Taliban forces that include wings in Afghanistan and Pakistan. Other insurgent organizations like the Haqqani Network and Hizb-i-Islami Gulbudden have a loose alliance of convenience with the Taliban. Additionally, there remains a residual al Qaeda presence.[12] All of these disparate groups are weakly united by an opposition to the Coalition and the government in Kabul and a desire to achieve political power of their own. This situation nearly requires a cumulative strategy because the various units rarely if ever coordinate their tactical actions. Even if each group is following its own sequential strategy, it will be the cumulative effect of those various efforts that the Coalition must oppose. The cumulative strategy of the opposition will achieve decisive effects only if the will of the Coalition to continue to invest blood and treasure in the government of Afghanistan. Therefore, profligate spending on additional troops, equipment, and nearly unlimited flows of money into various development projects only hastened the approach of a tipping point for the Coalition's will. Such investment would make sense for a sequential strategy, but in this case it also supports the strategy of the enemy.

Strategic Symmetry and Asymmetry

The above examples and explanations are all asymmetrical. One side chooses a strategic style while the other side chooses the defensive. The perceived asymmetry in tactics—the asymmetric warfare idea that is simply a rebranded version of guerrilla warfare—is not the important characteristic. Rather, it is the asymmetry in the chosen strategy that produces a situation of strategic asymmetry. In this situation, it seems that neither side can gain a decision through active means. The stronger side cannot go on the offense and annihilate a specific target and the weaker side cannot concentrate enough force without giving the opponent what it desperately wants. Nor does it need to. The decision only passively occurs when one side taps out or withers away into irrelevance. The better term for this situation might be parallel strategies: Never the two shall meet but one line will run out before the other. The question, posed by proponents of

asymmetric warfare, of how to fight asymmetric opponents is nonsensical. You outlast an opponent who is pursuing a strategy vastly different from yours. Or, perhaps, you change strategy to beat the enemy at his own game. Rather than waste time, energy, blood, and treasure pursuing a strategy that fails to address the strategy of your opponent, invest that effort in meeting him on the only field of competition open to him. The answer, then, to the question of how to beat an opponent who has chosen to pursue a strategy asymmetric to yours is to move perpendicularly rather than in parallel. A comprehensive strategy to asphyxiate the opponent is one option[13] but, as Milevski identified, opposing cumulative strategies produce long stalemates.[14] In this case, the strategist should match his opponent's cumulative strategy to conserve resources until an opportunity presents itself for a sequential, offensive strategy to succeed. This was Washington's genius: his pursuit of one strategy until an opportunity presented itself that demanded a decisive shift to another. He pursued a strategy that preserved the Continental Army as much as possible while avoiding its annihilation. Washington kept the Continental Army on the defense as long as he had to and sent Nathaniel Green south to execute an exhaustive campaign against Cornwallis. Once Cornwallis was exhausted enough to be pinned down at Yorktown, Washington turned on a dime to an offensive strategy of annihilation, marching south to force Cornwallis' surrender. The tactics at any given time—Washington's retreats, Greene's hit-and-run campaign, and finally Washington's march south—were determined by the strategy of the moment. Washington, of course, inspired Mao Zedong who proposed that insurgent armies should use a cumulative strategy until they are strong enough for a sequential strategy.[15]

Unfortunately, there is sometimes little the strategist can do to change the strategic dynamics involved. An enemy that chooses a cumulative and exhaustive strategy usually does so because he has no other choice and if he enjoys the benefits of the strategic defense there is little he can do to change it. Rather, the strategist confronted by such an enemy should follow the prescriptions of two of the masters: Sun Tzu and Clausewitz. Sun Tzu said, "What is of supreme importance in war is to attack the enemy's strategy."[16] And Clausewitz said, "The first, the supreme, the most far-reaching act of

judgment that the statesman and commander have to make is to establish by that test the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into, something that is alien to its nature."[17] The strategist must understand the nature of the war he is in and then he must address the enemy's strategy within that framework. Addressing the enemy's tactics is insufficient. If the strategist recognizes that he is confronted with an enemy that seeks to outlast, outmaneuver, and outsurvive him until his will is depleted, he will shy away from becoming overextended. He will choose his own strategy that preserves blood and treasure rather than spending it in a wanton manner trying to bribe the populace. But, like Washington, he will remain ready to seize opportunities.

APPENDIX E

Training and Education

What could not be practiced could not be executed in battle.

—Capt. Wayne P. Hughes Jr., USN (Ret.)

A tactical system like the one presented in this work is only one part of victory in battle. In every case a clever tactical plan must be executed on the ground by people, and it is the quality of those people in terms of their ability to perform in the chaos and sting of battle that determines whether that victory will become reality or remain aspirational. The training of the troops who will fight the battle is in fact so important that one could say that battles are not won on the battlefield, but rather in training.

From the Spartan *agoge* to Parris Island and Ranger School today, military forces have prided themselves on the toughness of their training. The physical and mental difficulty is indeed important, and provides a rite of passage that fosters future cohesion and devotion to the organization. Another aspect of effective training programs is the inculcation of habits of thought and ways of thinking in the minds of recruits. Such values can last an entire career. The values that kept the Spartan hoplites from leaving the pass at Thermopylae were implanted in Sparta during the *agoge.* Although most boot camps are predicated on training recruits to instantly follow orders, there is also usually an element of the training meant to foster the initiative and on-the-spot innovation that is becoming more and more important in warfare. For instance, Marine Corps recruits are thrust into leadership positions and presented with basic tactical problems during the Crucible, the culminating event of Marine Corps boot camp. Training

courses for officers lean much more heavily on these types of events. This is typically where the principles of war are introduced.

In my own experience, however, little is taught about the principles of war. Recruits are just expected to memorize whatever list is fashionable at the time and sometimes even additional principles for offense and defense. It is a little too much for a harried recruit to understand, especially without any context whatsoever. A common system of tactical theory like the one in this book can be taught in just a few minutes, but can be used as a common reference system for recruits, small unit leaders, and generals alike, will alleviate this problem.

But there is another problem occurring today, at least in the U.S. military. It is fortunate that it has a large number of veterans in its ranks. However, this is a liability for a military whose training and doctrine has seen no significant innovation in quite some time. A generation of Americans joined to fight the wars in Iraq and Afghanistan and were baptized in the chaotic and uncertain combat of the early twenty-first century. Many immediately grasped the exigencies of counterinsurgency operations in the information age far better than their senior officers with decades of peacetime experience. Upon returning to the United States and eventually to a peacetime military, those veterans were faced with an organization where the stagnant training, education, and even ideals now bore little relation to actual combat. One central idea was that if the military could fight "the big one"—a term for an American versus Soviet conventional war fantasy that was never likely even when the Soviet Union existed, due to the nuclear armaments of each side—it could fight any number of little ones. Iraq and Afghanistan proved that it could not, and the younger veterans had seen through the curtain maintained by senior leadership. This situation is certainly not unique to America in the twenty-first century. A seventeen-year old Clausewitz returned from the revolutionary wars with France and viewed the Prussian system of training and preparation as, "sham battles, long practiced in advance carefully discussed, arranged in every detail, were carried out by the most distinguished men in the service . . . with total absorption, and a degree of seriousness and energy that bordered on weakness."[1] Military catastrophes are born of military bureaucracies that fall in love with a certain set of

tactics and become too beholden to their strict execution. Retired captain Wayne P. Hughes Jr., quoted at the beginning of this appendix, has described how the tactics of the Royal Navy became ossified to the point where violations of proscribed tactics seemed to be the main goal of the fleet's existence. These descriptions, of other times and other places, are almost perfect descriptions of training in the U.S. military today. The one exception is the U.S. Army's National Training Center at Fort Irwin, California. What makes that training center different is the use of a live opposing force tasked with beating the unit being trained. Other training venues use scenarios played out by imaginary enemy units. Marine Corps Base Twenty-nine Palms, also in California, is one of the finest training areas in the history of military training but it is used for Marines to practice fighting pretend enemies while firing weapons at empty patches of sand. There, the slightest deviation from doctrine in training is publicly condemned. This practice, well intentioned or not, is one of the most destructive forces that a military organization faces.

Even such scenario-based training and outlawed creativity would be moderately effective if it had a solid connection with actual combat. What is broken about the training system in the U.S. military is its complete lack of a formal feedback system. Currently, innovations in tactics, techniques, and procedures are fed into doctrine and training pipelines in an ad hoc manner when random personnel from combat units are transferred to duties at training schools or tasked with writing doctrine: they bring with them experience that they then use to inform curricula and doctrine. The problem with this informal system was only half realized after Operation Iraqi Freedom, and thus only a half-measure was adopted to solve it. In response to tactical changes occurring during the wars in Iraq and Afghanistan, the U.S. Army created the Center for Army Lessons Learned and the Marine Corps created the Marine Corps Center for Lessons Learned. These organizations were intended to capture lessons from the operations then occurring, but were tasked solely with examining what the friendly forces were doing. Additionally, there is no formalized mechanism by which the lessons captured inform doctrine and training. This step was simply never taken. There is also no formal connection with intelligence organizations, so the lessons learned are never informed by what the enemy is doing. The

U.S. military is looking at the lessons of the recent wars with only one eye open.

The solution is to develop a training, doctrine, intelligence, and education system that functions in and of itself as a feedback loop. Like the cycling of a firearm, tactical concepts must be generated in such a way that one cycle facilitates the next. This can be accomplished by utilizing organizational components that gather information about friendly and enemy tactics, analyze both friendly and enemy tactics, feed that information into doctrinal publications, inculcate new tactics by using the doctrine to train service members, who then feed information about the effectiveness of new tactics to the organization that gathers the information, starting the cycle again. Any military organization must collect, analyze, codify, train, and execute new tactics; the military organization that does so faster than its opponents will succeed. Organized along the lines of collection, analysis, codification, training, and execution, such an organization can inherently drive innovation forward, its form facilitating its function. Neither the Marine Corps' Training and Education Command or the Army's Training and Doctrine Command is organized in this manner but rather in a hierarchical manner lifted directly from combat units. There is no engine that drives innovation, so each service is just idling without moving forward.

The education system is much better off: schools like the Naval War College, the Army War College, and the National Defense University are world renowned for good reason. However, officers can attend these schools as a resident student only after more than a decade of service. The education provided at such schools is useful and necessary on day one of an officer's service, but he is deprived of it for another decade at least. One point made in this book is that tactics must always serve—or else they harm—strategy. An officer in any capacity is thus responsible for executing strategy from the moment he checks in to his unit. The reason for our continued refusal to arm our officers with the education they need to do their job is that a lieutenant or ensign is a tactician and not a strategist. If the reader has made it this far in this book, he surely recognizes this idea as specious. The company grade officer is a tactician but simultaneously is a servant of the strategy.

John Boyd is reported to have said that the U.S. military must ensure that is has the right people, ideas, and technology, in that order. A tactical system is nothing without smart tacticians to employ it and well-trained troops to execute it. The U.S. armed forces are lucky to have many of both, but thus far they have relied on luck. Modernizing training and education in order to produce them is a necessity well past its due date.

APPENDIX F

Philip's Gift: The Organization of Tactically Successful Militaries

The first true modern military was developed by the Assyrian Empire that existed in Mesopotamia from 2025 to 612 BC. This is counterintuitive, of course, and "modern" is thus a poor word to describe the types of militaries that can execute tactics along the lines presented in part I. Professional is also a poor word because not all of these organizations were professionally organized along lines that we would recognize today. Whether they were "professional" or not, all of them reached a level of tactical refinement above and beyond their peers.

The Assyrians were effective, first, because of their use of chariots. The flat ground and sparse ground of Mesopotamia made the weapon ideal. But as the Assyrians conquered, they learned. They developed a professional army by integrating the units and methods of their defeated enemies.[1] This produced rapid tactical innovation based on changing conditions and a large military with a variety of specialized units, from archers to infantry and slingers, cavalry, and a variety of chariots. They used a combined arms concept at the lowest level: Assyrian archers worked in buddy teams with shield-and spear-bearing infantry. The archer would fire while his infantry comrade would protect him from enemy cavalry and infantry in the formation. Their earliest chariots held two men: one to drive and one to fire arrows. Later chariots were larger and carried four men: a driver, an archer, and two shield bearers. They were, in effect, an ancient tank that combined maneuverability, firepower, and armor.

The Assyrians, however, kept their empire together by brutal violence and terrorism. This was eventually self-defeating because their highly developed army could not compete with the mass of a coalition of their enemies working together. That coalition, composed of Babylonians, Medes, and Scythians, besieged and destroyed the Assyrian capital of Nineveh in 612 BC.[2]

History shows that when successful militaries are developed, they dominate their neighbors or other opponents but then decline, usually as their opponents learn to fight and tactically catch up, just as the anti-Assyrian coalition did. Historians generally believe that whereas Alexander the Great was a remarkably effective battlefield commander, his conquests were won using a tool built by his father, Philip II. The Macedonian army organized, trained, and first used by Philip was a revolutionary force for its time as the Assyrian Army no longer existed. The military arms of other Greek states were inordinately focused on the *hoplite* phalanx as the main arm of victory. Even reformers such as Epaminondas of Thebes still used the phalanx as a base. What was revolutionary about the Macedonian army is the almost equal weight placed on the maneuverability of cavalry, the institutionalized use of light troops such as archers and *peltasts,* the integration of then-new siege technology, and the continued use and even improvement of the phalanx as a still-essential component of battle. The integration of these three arms stands in contrast to the army of Xerxes. It is impossible to know for sure exactly how large the army that Xerxes used to invade Greece was but it was clearly massive, even by modern standards. Xerxes too had cavalry, infantry, ranged troops, and even other specialists such as engineers. Additionally, he used his land forces in concert with naval forces. All of these myriad forces, however, were drawn from all over the expansive Persian Empire without having the opportunity to train or rehearse together. If the accounts of the battle of Thermopylae are to be believed, Persian forces were frequently committed piecemeal rather than as a combined team.

True revolutions in military affairs, therefore, involve the integration of various military forces into a combined arms teams that worked together, rather than independently. A well-trained military force is a fine tool, but despite the quality, it still must be wielded by one skilled in its use.

Alexander, for example, was eminently so and in this he stood head and shoulders above his contemporary commanders and indeed the majority of military commanders since. Alexander understood exactly how to use this revolutionary military machine. Its flexibility, durability, responsiveness, and prowess was a new phenomenon in the world. Nothing could stand in its way when it was handled by a gifted military commander.

The most successful military organizations in history all share these aspects with the Assyrian and Macedonian armies, and their now legendary successes can be attributed not just to the effective use of tactics described in part I but also the armies' organization. They were organized in order to execute good tactics and not based on tradition, effective administration, or budgetary lines. Those that organized for the latter reasons failed, while others did not. This was the conclusion drawn by Stephen Biddle in *Military Power:* the organization of armies is a more important determinate of success than are numbers or technological edge. Biddle focused on the twentieth century, but the rest of military history provides ample evidence as well.

The question of how to measure the success or effectiveness of a military is a difficult one. One answer is, "Military effectiveness is the process by which armed forces convert resources into fighting power."[3] However success is measured, though, some armies throughout history have been undeniably successful at achieving tactical success. Some, like the German army, have been assigned strategically foolish or impossible goals. Still, by examining some of the most successful tactical organizations in history, we can draw some conclusions about what makes a successful military.

The Roman Legion

Despite recent fascination with the ancient Greek *hoplites,* the Romans were an order of magnitude more successful than any ancient Greek force. This was due to their extremely unique force structure adopted after the Pyrrhic Wars, the Legion.

Rather than use one line of troops, the Roman Legion used three. The first line was the *hastati:* lightly armed younger troops. The *principes* were the second rank: more experienced than the *hastati* and with heavier

equipment. The last line was the *triarii.* These were the oldest veterans and were used as a reserve force in times of emergencies. Around this base were *velites,* lightly armed missile troops, *equites*, the cavalry, and *auxilia* who were allied troops of various kinds. It was nearly as strong to the front as the phalanx to the front but with better-protected flanks. In the Macedonian Wars of the third century BC, Roman Legions cut Greek phalanxes to ribbons.

This specialization offered flexibility. Against nearly any kind of any troops, the Legion had an answer. *Equites* for enemy archers, *triarii* spearmen for enemy cavalry. Like the phalanx, the Romans used shields to form an armored frontline but preferred short swords to long spears. On the ancient battlefield, it was usually the side who could endure the horrific conditions of the frontline longer who would prevail. The Romans mitigated this fact by using a simple trick to extend their own endurance, manipulating the tempo of the battle to their advantage. Roman Legionnaires were trained as lines. When a signal was sounded, the first line would withdraw and the next line would replace it as one. This maneuver required excellent training, which the Romans had, but the effect was that exhausted enemy troops had to face fresh Roman troops every few minutes.

Unique among the armies on this list is the Roman Legions' ability not just to win in battle and achieve control over territory, but also to hold that territory. Alexander and his successors held his gains for a few short years. The Mongols, when they took political control over territory, held it only for decades. Rome held on to its gains for centuries. The history of the Roman Legions strikes down the notion that militaries must be designed for either the defeat of enemy military forces or the control of conquered territory. The Roman Legions did not just conquer territory, but they also held it and, through public works projects and economic means (what today we call civil affairs), they assimilated with it. Although there were rebellions and those rebellions were frequently put down in brutal fashion, the achievements of the Roman soldiery have yet to be replicated.

Roman Legions were commanded by consuls who were also a head of state, roughly like our president today although there were two at all times. This unification of both political and military power in one (or two) people was a form of decentralized command: the power of the senate and the

people of Rome were invested in the elected consul who then commanded the Legions.

Another key aspect of the Roman military's success is the Romans' openness when it came to new ideas. The Roman Legions quickly and enthusiastically adopted new tactics, techniques, and methods from the enemies they had faced. This is a dramatic difference from the Spartans who disdained any tactic but the one they were most comfortable with employing. Second, Rome instituted major military reforms in direct response to victory or defeat. The Roman Legion itself was developed after the difficult wars with Epirus of Pyrrhus. The Roman Navy was created, manned, and employed in little more than months in response to the First Punic War. The Marian Reforms in 107 BC completely revamped the force structure and manpower policies of the Roman military in response to defeat in the Jugurthine War. The employment of Roman Legions again changed under the Emperor Augustus in response to the now massive territory that the Legions needed to protect. This constant evolution and innovation is a major reason that the Roman Legions make this list but the Spartans—who shunned change—do not.

The Mongol Horde

For a brief time in the twelfth and thirteenth centuries the Mongols controlled the largest contiguous land empire in history. The Mongols were just one ethnic group that existed on the Asian steppes at the time, and that region was flanked by the advanced civilizations of China in the east and the Khwarezm Sultanate in the west. But one leader, Chingis (Ghengis) Khan, united the Mongol clans who then conquered an empire spanning continents. They were never really defeated. Rather it was internal disunion that led to the contraction of the empire.

Chingis Khan conquered this empire using superbly trained horse archers as the basis of the military. Mongol horsemen practically grew up in the saddle, beginning to ride at age three. They could stay in the saddle for days at a time and would even cut their horses' skin to drink their blood for sustenance. Constant practice with bow and arrow meant that Mongol archery was second to none. Highly mobile firepower in great numbers thus was the basis of the Mongol victories.

Furthermore, the Mongols had developed their own tactical system derived from hunting tactics. They fought just like they hunted: using maneuver, mass, firepower, and tempo in combination to corral and slaughter large numbers of steppe animals. For example, through observation of animal behavior they learned to surround herds and channel them to an obvious escape route, where another group of Mongols would be waiting in ambush. They replicated this against human beings at the Battle of Mohi Bridge (discussed in chapter 10). Panicked Hungarian knights became little more than game to the Mongols. This common tactical outlook allowed detached Mongol commanders to operate in much the same way as the armies under Chingis Khan, fostering decentralized command in an age where such methods were virtually a necessity.

Finally, the Mongols had a fearsome reputation, which was no accident. Mongol policy was to exterminate the population of any city that had failed to surrender to them immediately. The killing was conducted in brutal, systematized fashion and then advertised. Initial Mongol armies lacked any sort of siege equipment or expertise, so the brutality of their victories was a compensation for this fact and meant to induce future cities to surrender rather than fight. In many cases, it worked. But like the Roman Legionnaires, the Mongols were keen to adopt effective methods from their enemies. After the Mongols conquered parts of China, Chinese engineers were pressed into service to build their siege engines. Other troops from every defeated nationality were also forced into service with the horde to assist the horsemen.

The Napoleonic Corps

The success of French arms under Napoleon Bonaparte must, in large part, be attributed to the genius of the man himself both in tactics and when it came to inspiring troops to follow him. However, his tactical masterpieces would not have been possible without significant changes he made to the French army that facilitated those tactics. That change is what allowed him to steamroll every other military force in Europe until Waterloo. Like the U.S. military of today, Napoleon’s war machine was so dominant that enemies like the Spanish and Russians had to make drastic turns toward guerrilla tactics in order to face it.

This dominant French army was formed around the *corps d'armée*. The idea behind a *corps d'armée* was that it had enough combat power to hold its own for a time if caught by a superior force; until it was caught, however, it could move much faster than the army as a whole. This meant that it had to be a combined arms force: it had infantry, cavalry, and artillery units integrated within it. Its composition was never the same, however, and Napoleon would change their composition based on his assessment of the situation. This adaptability is another hallmark of success.

However the different corps were composed, Napoleon used them in much the same fashion. Each would march separately but would arrive at an identical point of Napoleon's choosing. The army that faced Napoleon thus had no true picture of his true strengths because French reinforcements could arrive at any point at any time. His favored maneuver, a wide single envelopment followed by an attack from the enemy's rear, was facilitated by his ability to move troops faster than his enemies in order to completely outflank them. Napoleon's tactics required speed and delegation that made centralized command impossible. Decentralized command was at many times forced on Napoleon by his own audacious tactics.

This system was so successful that at the Battle of Jena-Aurstadt, one of Napoleon's corps commanders faced the bulk of the Prussian army and, despite being vastly outnumbered, defeated it while Napoleon faced and defeated a smaller Prussian detachment.

The Panzer Division

Although the panzer divisions developed by the German Wehrmacht before World War II and then used by Adolf Hitler fought for perhaps the most vile cause in human history, we can still learn from their organization and effectiveness. Although the Germans never used the term, the panzers were so effective that the term "blitzkrieg" was invented to describe it.

The panzer division was built for operational tempo. It had enough punch to create gaps in an enemy line but the speed to then exploit that gap and force enemy units off balance through speed alone. This was a compensation for mass that, after World War I, the Germans knew that they could not support. The panzer division was built around tank units—but included motorized infantry units plus dedicated aircraft and artillery

support. The exact mix changed frequently, another nod to adaptability, but the combined arms aspect of tanks–infantry–fire support was always maintained. Certainly, not all of the Wehrmacht was composed of panzer divisions; nevertheless, these divisions were definitely the tip of the spear. Finally, the panzer units could only fight because of modernized logistics, including motorized logistics trains.

While panzer divisions were organized for shock power, adaptability, and combined arms, the true key to their success was the German officer corps culture of *Aufragstaktik* and a training and education system that fostered initiative within its officers. The legendary panzer commanders like Heinz Guderian and Erwin Rommel were produced by decades of thoughtful, purposeful education. That Adolf Hitler was able to turn such a weapon for his own purposes is a tragedy in and of itself.

Today

The dominant military of our time is that of the United States. Both the Army Brigade Combat Team and the Marine Corps Marine Air Ground Task Force (which comes in three formats: the Marine Expeditionary Unit formed around an infantry battalion, the Marine Expeditionary Brigade formed around an infantry regiment, and the Marine Expeditionary Force formed around an infantry division) are the extant examples of military units organized along the same lines as Alexander's army and its successors. However, these units have not truly been tested. Formed after Vietnam, they did perform well against the Iraqi army in both 1991 and 2003. These two conflicts, however, cannot be held up as a valid test. In both cases the Iraqi army was poorly led and technologically outmatched to a high degree; its troops suffered from dismal morale and questionable loyalty to the regime of Saddam Hussein, and were unevenly trained. The performance of the Iraqi army would have been considered abysmal even if the two wars had been exercises. Such an obligingly poor adversary cannot serve as data for a valid assessment of the American forces.

Conclusions

This quick and by no means exhaustive survey of tactically successful military organizations nevertheless offers some clear conclusions about how to organize a military force for victory in battle.

1. Combined arms units are ideal. They offer combat power but can be moved independently at a high tempo and then can be combined with other like units to achieve mass. The flexibility and adaptability of units that include a variety of unit types within them is vital.
2. The key to success is combining mass and firepower in a package that can operate at a fast tempo and thus outmaneuver enemy forces.
3. The willingness to adopt tactical innovations, even those of the enemy, is a factor in long-term success and viability.
4. Each of the above organizations arose out of a clear-eyed and unemotional assessment of both friendly and enemy strengths and weakness in the wake of decisive defeats (except in the case of the Mongols). A military force must periodically and honestly assess itself and use that assessment as a driver of innovation.
5. Decentralized command and a leadership corps that is highly trained and educated is the sole route to high tempo and effective flexibility, which allows more options for the use of mass, maneuver, and firepower.

NOTES

Preface

1. Clausewitz, *On War,* 141.

Chapter 1. On Theory and Tactics

1. Clausewitz, *On War,* 136.
2. Wylie, *Military Strategy,* 31.
3. Gray, *Strategy Bridge.*
4. U.S. Army, *FM 3-24 Counterinsurgency.*
5. Clausewitz, *On War,* 97.
6. Ibid., 141.
7. Ibid., 95.
8. Clausewitz, *Principles of War.*
9. Ibid., 15.
10. Clausewitz, *On War,* 261.
11. Sumida, *Decoding Clausewitz,* 19.
12. Foch, *The Principles of War,* 13.
13. Fuller, *The Foundations of the Science of War.*
14. Ibid. A tripartite view of the nature of mankind is an idea that stretches back as far as early Hindu thought in India, particularly in the *Bhagavad Gita,* composed somewhere between the fifth and second centuries BC.
15. Joint Chiefs of Staff, *Doctrine for the Armed Forces of the United States,* I-3.
16. Wylie, *Military Strategy,* 19–20.
17. Echevarria, "Principles of War or Principles of Battle?," 64.
18. Leonhard, *Principles of War,* 8.
19. Whitman, *Verdict of Battle,* 240.

20. Boyd, *A Discourse on Winning and Losing,* "Patterns of Conflict," Slide 137.
21. Ibid., "Strategic Game of? and?," Slide 35.
22. Miles, "The Corinthian Threat."
23. Echevarria, "Principles of War or Principles of Battle?," 58.
24. Clausewitz, *On War,* 89.
25. Hawking, *Illustrated A Brief History of Time,* 18.

Chapter 2. The Tactician's Task

1. U.S. Marine Corps, *MCDP: 1-0: Operations,* C-2.
2. Clausewitz, *On War;* first quote on 90, second quote on 97.
3. Hutton, *Kelly's Heroes,* 1970.
4. Shy, "Jomini," 172.
5. Ibid., 146.
6. Fehrenbach, *Fire and Blood,* 144.

Chapter 3. Maneuver

1. McPherson, *Battle Cry of Freedom,* Location 10713.
2. Ibid., Location 10685.
3. Herodotus, 7.9.2, quoted in Hanson, *Western Way of War,* 9–10.
4. *Hoplite* (plural: *hoplites*) is the ancient Greek word for the infantry traditionally employed by the Greek states at the time. The name comes from the distinctive round shield, the *hoplon,* that enabled the phalanx formation. Greek soldiers would also be equipped with greaves, a long thrusting spear, a short sword, and sometimes a breastplate. Such soldiers are also referred to as *hoplites.*
5. Hanson, *Western Way of War,* 14.
6. Cartledge, *Alexander the Great,* 163.
7. Oman, Beeler, and Oman, *Art of War in the Middle Ages,* 60.
8. Chandler, *Campaigns of Napoleon,* 390.
9. Gudmonsson, *Stormtroop Tactics,* 20, 47–48.
10. Beevor, *Second World War,* Location 3930.
11. Liddell Hart, *Strategy.*
12. Beevor, *Second World War,* Location 1794.
13. Ibid., Location 1812.

14. Cordesman, *Iraq War,* 62.
15. Fick, *One Bullet Away,* 209.
16. West and West, *No True Glory,* 257–58.
17. The forms of maneuver here are from United States Marine Corps doctrine, specifically *MCDP: 1-0: Operations,* 9-9 to 9-17.
18. Julian Borger, "Wake Up Call," *The Guardian* (UK), 5 September 2002.
19. Kilcullen, *Out of the Mountains,* Location 1522.
20. Guevara, *Guerrilla Warfare,* 13.
21. Quote in Griffith, *Forward into Battle,* 68.
22. House, *Combined Arms Warfare in the Twentieth Century,* 260.

Chapter 4. Mass

1. Beevor, *Second World War,* Location 7422.
2. Beevor, *Stalingrad,* 124.
3. Beevor, *Second World War,* Location 7314 and 7345.
4. Clausewitz, *On War,* 194–97; quote on 194.
5. Ibid., 197.
6. Tanner, *Afghanistan,* 176–87.
7. Naylor, *Relentless Strike,* 182–83.
8. Grant, *Personal Memoirs,* 365–66.
9. McPherson, *Battle Cry of Freedom,* Location 14023.
10. Ibid., Location 14042.
11. Ibid., Location 14069.
12. Craighill and Mendell, *Art of War,* 93.
13. Andrews, "Tactical Development," 53.
14. Archer, Ferris, Herwig, and Travers, *World History of Warfare,* 337.
15. Morris, *Washing of the Spears,* 50–53.

Chapter 5. Firepower

1. Ibid., 393–97.
2. Hughes, *Fleet Tactics,* 74.
3. Scales, "Adaptive Enemies," 5.
4. Keegan, *First World War,* 78, 84, 86.
5. Chandler, *Campaigns of Napoleon,* 155.

6. Staff of the U.S. Army Combat Studies Institute, "Wanat," iii.
7. Ibid., 142–48.
8. Biddle, *Military Power,* 44.
9. Warner and Warner, *Tide at Sunrise,* 542.
10. Rabinovich, "From Futuristic Whimsy to Naval Reality," 41–47.
11. Hughes, *U.S. Naval Institute on Naval Tactics,* 72.
12. Citino, *Blitzkrieg to Desert Storm,* 239.
13. Ibid., 240–41.
14. Wedgwood, *Thirty Years' War,* 288.
15. Ibid., 291.
16. Keegan, *First World War,* 22.

Chapter 6. Tempo

1. Corram, *Boyd,* 114, 115.
2. I have had the good fortune to examine John Boyd's copy of *On War,* now in the possession of the invaluable Marine Corps Archive, part of the Gray Research Center at Marine Corps Base, Quantico, Virginia.
3. Encyclopaedia Britannica online, "Entropy."
4. Wylie, *Military Strategy,* 22–23.
5. Kissinger, "The Vietnam Negotiations," 214.
6. Griffith, *Forward into Battle,* 161.
7. Polybius, *Rise of the Roman Empire,* 254.
8. Ibid., 256.
9. Ibid., 274.
10. *Cataphracts* were heavily armored cavalrymen on heavily armored horses.

Chapter 7. Deception

1. Sun Tzu, *Art of War,* 102.
2. Ibid., 91.
3. Hastings, *Inferno,* 510.
4. Polybius, *Rise of the Roman Empire,* 259–60.
5. May, *Mongol Art of War,* 12.
6. Waters, *Official History of New Zealand,* 55–56.
7. Pope, *Battle of the River Plate,* 183.

8. Chandler, *Campaigns of Napoleon,* 432.
9. Citino, *Blitzkrieg to Desert Storm,* 280–81.
10. Cordesman, *Iraq War,* 59.

Chapter 8. Surprise

1. Leckie, *George Washington's War,* 600–3.
2. West and West, *No True Glory,* 195–96.
3. Storr, *Human Face of War,* 47–48.
4. Spector, *Eagle against the Sun,* 88.
5. Millett and Murray, *A War to Be Won,* 177–78.
6. Karnow, *Vietnam*, 542–45.
7. Clausewitz, *On War,* 198.
8. Ibid., 201.

Chapter 9. Confusion

1. Clausewitz, *On War,* 198.
2. Account by Lieutenant Dunbar, quoted in Keegan, *Book of War,* 100–1. Spelling, punctuation, and bracketed clarifications as found in Keegan. Keegan's word *holloa* means to holler or yell, and *poltroon* is a synonym for coward.
3. Citino, *Blitzkrieg to Desert Storm,* 206.
4. West and West, *No True Glory,* 258.
5. Gudmonsson, *On Artillery,* 156.

Chapter 10. Shock

1. U.S. Marine Corps, *MCDP: 1: Warfighting,* 50.
2. U.S. Army, *FM 3-90,* 3-35, 3-42.
3. U.S. Government, *Joint Publication 1-02.*
4. Storr, *Human Face of War,* 88.
5. Oman et al., *Art of War in the Middle Ages,* 76–77.
6. Griffith, *Forward into Battle,* 20–22, quote on 20.
7. Showalter, *Hitler's Panzers,* 5, 99.
8. Hamza Hendawi, Qassim Abdul-Zahra, and Bassem Mroue, "A Secret to IS Success: Shock Troops Who Fight to the Death," *Associated*

Press, 8 July 2015.

9. Jünger, *Storm of Steel,* 30–31.
10. Eric Schmitt, "U.S. to Send Rockets to Iraq for ISIS Fight," *New York Times,* 20 May 2015.
11. Spector, *Eagle against the Sun*, 270, 498.
12. Cordesman, *Iraq War,* 275.
13. Rommel, *Attacks,* 14.
14. May, *Mongol Art of War,* 77, 95.

Chapter 11. Moral Cohesion

1. Sun Tzu, *Art of War,* 64.
2. Clausewitz, *On War,* 185–86.
3. Du Picq, *Battles Studies,* Location 1159.
4. Whitman, *Verdict of Battle,* 178.
5. U.S. Marine Corps, *MCDP: 4: Logistics.*
6. Quoted in Keegan, *Book of War,* 162.
7. Storr, *Human Face of War,* 51.
8. Friedman, *21st Century Ellis,* 17.
9. Whitman, *Verdict of Battle,* 11.
10. Frederick, *Black Hearts,* xv–xvi.
11. Gray, *Strategy Bridge,* 217.
12. Jones, *Wars of the Roses,* 21.
13. Moorehead, *Gallipoli,* 282–86.
14. Knights, "ISIL's Politico-Military Power in Iraq."
15. Clausewitz, *On War,* 259.

Chapter 12. The Culminating Point of Victory

1. Clausewitz, *On War,* 566.
2. Hastings, *Inferno,* 571–73; quote on 571.
3. Millett and Murray, *A War to Be Won,* 464.
4. Hastings, *Inferno,* 573–74.
5. U.S. Marine Corps, *MCDP: 1: Warfighting, 35.*

Chapter 13. The Offense, the Defense, and the Initiative

1. U.S. Marine Corps, *MCDP: 1-0: Operations,* 6-4.
2. Clausewitz, *On War,* 358.
3. Ibid., 357.
4. Clausewitz, *On War;* first quote on 190, second quote on 571, third quote on 357.
5. U.S. Army, *ARDP: 3-90 Tactics;* first quote on 3-1, second quote on 4-1.
6. McPherson, *Battle Cry of Freedom,* Location 568–69.
7. O'Reilly, *Fredericksburg Campaign,* 20.
8. Ibid., 14.
9. Ibid., 30–32.
10. McPherson, *Battle Cry of Freedom,* Location 570.
11. Ibid., 570.
12. Ibid., 571–72.
13. Morris, *Norman Conquest.*
14. Hughes, *Fleet Tactics,* 106.

Chapter 14. Command and Control

1. Quoted in Goerlitz, *History of the German General Staff,* Location 210.
2. Griffith, *Forward into Battle,* 180.
3. Showalter, *Hitler's Panzers,* 98.
4. Sun Tzu, *Art of War,* 135.
5. Dempsey, *Mission Command White Paper,* 5.
6. See Sun Tzu, *Art of War,* chapter 5.
7. Lind, *Maneuver Warfare Handbook,* 18.

Chapter 15. Environment and Geography

1. U.S. Government, *Joint Publication 2-01.3,* GL-7.
2. Fehrenbach, *This Kind of War,* 191.
3. Ibid.
4. Ibid., 193–96.
5. Ibid.

6. Ibid., 198.
7. Ibid., 197.
8. Ibid., 204.
9. Ibid., 225.
10. Ibid., 248.
11. Ibid.
12. Citino, *Blitzkrieg to Desert Storm,* 144–45.
13. Ibid., 160.

Chapter 16. Crossing the Bridge

1. Gray, *Strategy Bridge,* 32–34.
2. Clausewitz, *On War,* 255.
3. Ibid., 595–96.
4. This section uses both Thucydides' *The Peloponnesian War* and Wilson, *Masters of War.*
5. Wilson, *Masters of War.*
6. Gray, *Strategy Bridge,* 32–34.
7. Meier, *Caesar,* 372.
8. U.S. Army, *FM 3-24 Counterinsurgency.*
9. The Anbar Awakening was the decision of Sunni tribes to shift their support from Al Qaeda in Iraq to Coalition forces in Al Anbar Province, Iraq. The ongoing civil war between Iraqi Sunnis and Shias, especially around Baghdad, caused Sunni and Shia civilians to move out of mixed neighborhoods and into homogenous enclaves. Both of these contributed to the drop in violence.

Conclusion

1. Clausewitz, *On War,* 89.
2. Ibid., 267.
3. Sumida, *Decoding Clausewitz,* 19.
4. Hawking, *Illustrated A Brief History of Time,* 73.

Appendix A. The Principles of Planning

1. Frost, "Growing Imperative to Adopt 'Flexibility.'"

2. Keegan, *First World War,* 28.
3. Chief of the Defence Staff, *Canadian Forces Joint Publication 01: Canadian Military Doctrine*, 2-4.

Appendix B. The Operational Level of War

1. Echevarria, *Reconsidering the American Way of War,* Location 1252.
2. Owen, "The Operational Level of War," 17–20; quote on 17.
3. Ibid.
4. Echevarria, *Reconsidering the American Way of War*, Location 1252.
5. Kelly and Brennan, *Alien*.
6. Vego, *Joint Operational Warfare,* I-3.
7. Bengo and Shabtai, "The Post Operational Level Age," 4–9; quote on 8.

Appendix C. The Center of Gravity

1. Echevarria, *Clausewitz and Contemporary War,* 184–85.
2. Clausewitz, *On War,* 88.
3. U.S. Army, *FM 3-24 Counterinsurgency,* 1-1.
4. Kilcullen, *Counterinsurgency,* 7.
5. Smith, *Utility of Force,* 357.
6. U.S. Army, *FM 3-24 Counterinsurgency,* 1-1.
7. Echevarria, *Reconsidering the American Way of War,* Location 2547.
8. Clausewitz, *On War,* 485.
9. Ibid., 486, 596.
10. Ibid., 617.
11. Ibid., 92.
12. Echevarria, "Clausewitz's Center of Gravity," 113.
13. Strachan, *Clausewitz's* On War, 132.
14. Clausewitz, *On War,* 596.
15. Sumida, *Decoding Clausewitz,* 173–74.
16. Ibid., 172.
17. Gray, *Strategy Bridge,* 221.
18. Freedman, *Strategy*, 91.
19. Kennedy, *Great Arab Conquests,* 182.
20. Paret, *Makers of Modern Strategy,* 206.

21. Wylie, *Military Strategy,* 47.
22. Sun Tzu, *Art of War,* 97.
23. Echevarria, "Clausewitz's Center of Gravity," 110.
24. Echevarria, *Clausewitz and Contemporary War,* 111–13.
25. Wylie, *Military Strategy,* 77.
26. Ibid., 79.
27. Hastings, *Inferno,* 297.
28. Ibid., 296.
29. Beevor, *Stalingrad*, 70, chap. 5.
30. Ibid.
31. Hastings, *Inferno*, 297.
32. Ibid., 301.
33. Ibid., 302–4.
34. Beevor, *Stalingrad,* 97, 213.
35. Hastings, *Inferno,* 308.
36. Ibid., 308, 313.
37. Ibid.
38. Beevor, *Stalingrad,* 135.
39. Murray and Millet, *A War to Be Won*, 289–91.
40. Gray, *Strategy Bridge*.
41. Clausewitz, *On War,* 89.

Appendix D. Conventional vs. Guerilla Warfare

1. This appendix is a sequel of sorts to an article the author wrote in arguing that the difference between conventional and irregular warfare is meaningless at the tactical level (Friedman, "Blurred Lines").
2. Strachan, *Direction of War,* Location 4203.
3. Paret, *Clausewitz and the State,* 189.
4. Friedman, "Blurred Lines," 25–28.
5. Clausewitz, *On War,* 363.
6. Ibid., 357.
7. Ibid., 365.
8. Ibid., 570.
9. Delbrück cited in Gordon, "Delbrück," 341.

10. Wylie quoted in Milevski, "Revisiting J. C. Wylie's Dichotomy of Strategy," 224.
11. Ibid., 239.
12. Simpson, *War from the Ground Up,* 75.
13. Friedman, "Creeping Death."
14. Milevski, "Revisiting J. C. Wylie's Dichotomy of Strategy," 241.
15. Ibid., 233.
16. Sun Tzu, *Art of War,* 77.
17. Clausewitz, *On War,* 88.

Appendix E. Training and Education

1. Quoted in Paret, *Clausewitz and the State,* 45.

Appendix F. Philip's Gift

1. Archer, Ferris, Herwig, and Travers, *World History of Warfare,* 23.
2. Ibid., 29.
3. Millett and Murray, *Military Effectiveness Volume I,* 2.

GLOSSARY

agoge: Spartan hoplite training process, mandatory for all male citizens

Aufragstaktik: The practice of employing mission tactics, or assigning a mission to a subordinate without mandating how it is to be accomplished

auxilia: Roman auxiliary forces

center of gravity: The binding or animating force of a strategic actor, connected to its political aim or aims.

cheng: From Sun Tzu; normal or direct force

ch'i: From Sun Tzu; extraordinary or indirect force

confusion: A state of mental overload or disarray that makes it difficult to react to events and understand the situation

deception: The manipulation of the enemy's understanding of the situation in order to achieve a situation more advantageous to yourself

diekplous: Naval tactic used by ancient Greeks to infiltrate the line of an enemy fleet and attack it from behind

Ermattungsstrategie: German; strategy of exhaustion

firepower: The ability to apply ranged weapons at an advantage against enemy forces

hastati: Roman infantry of the first line

helots: Enslaved people in Spartan society

hoplite: Greek; heavy infantry

jus ad bellum: Latin; justice before war

jus in bello: Latin; justice during war

maneuver: Attacking an enemy force from a position of comparative advantage

manoevre de derrière: French; maneuver onto the rear

maskirovka: Russian, camouflage

mass: An advantageous concentration of combat power in space and/or time
moral cohesion: The state of connectives, community, and camaraderie in a military unit produced by the combination of the morale, effectiveness, ethics, professionalism, and dedication of its members and the ability of its leaders
morale: A description of the enthusiasm of a military force; one of the factors that contribute to its moral cohesion
Niederwerfungsstrategie: German; strategy of annihilation
peltasts: Greek light infantry equipped with throwing javelins
policy: The description of the political dynamics that a government intends to impose on an enemy state or a region; the political end state of a war
principes: Roman infantry of the second line
Schwerpunkt: German; main emphasis or main effort
shock: A state of psychological overload caused by the sudden or unexpected action of the enemy
strategy: The use of violent means in ways that achieve the policy end state over the long term
surprise: The act of presenting your enemy with a situation or capability for which he is mentally unprepared
tactics: The use of military forces to achieve victory over opposing enemy forces over the short term
tempo: The ability to control the pace of combat to your advantage and the disadvantage of the enemy
tenet: Tenet as used here means a main tactical concept that is not necessarily as strong as a principle or law
triarii: Roman infantry of the third line
velites: Roman light infantry

BIBLIOGRAPHY

Andrews, Frank. "Tactical Development." *U.S. Naval Institute Proceedings* (April 1958): 65–73. Reprinted in Wayne P. Hughes Jr., *The U.S. Naval Institute on Naval Tactics*. Annapolis, MD: Naval Institute Press, 2015.

Archer, Christon I., John R. Ferris, Holger H. Herwig, and Timothy H. E. Travers. *World History of Warfare.* Lincoln: University of Nebraska Press, 2002.

Beevor, Antony. *D-Day: The Battle for Normandy.* New York: Penguin, 2009.

———. *The Second World War*. New York: Little, Brown, 2012. Kindle edition.

———. *Stalingrad: The Fateful Siege 1942–1943*. New York: Penguin, 1998.

Bengo, Yakov, and Shay Shabtai. "The Post Operational Level Age: How to Properly Maintain the Interface between Policy, Strategy, and Tactics in Current Military Challenges." *Infinity Journal* 4, no. 3 (2015).

Biddle, Stephen. *Military Power: Explaining Victory and Defeat in Modern Battle.* Princeton, NJ: Princeton University Press, 2006.

Boyd, John. "Aerial Attack Study." 1964.

———. "A Discourse on Winning and Losing." Project on Government Oversight, Washington, DC. http://dnipogo.org/john-r-boyd/, 2007.

Cartledge, Paul. *Alexander the Great: The Hunt for a New Past* (1st ed.). New York: Overlook Press, 2004.

Chandler, David. *The Campaigns of Napoleon.* New York: MacMillan, 1966.

Chief of the Defence Staff. *Canadian Forces Joint Publication 01: Canadian Military Doctrine*. Ottawa, ON: Department of National Defence, 2009.

Citino, Robert M. *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare.* Lawrence: University of Kansas Press, 2004.

Clausewitz, Carl Von. *On War.* Translated by Peter Paret and Michael Howard. Princeton, NJ: Princeton University Press, 1976. Original published 1832.

———. *Principles of War.* Translated by Hans W. Gatzke. Mineola, NY: Dover, 2003.

Cordesman, Anthony. *The Iraq War: Strategy, Tactics, and Military Lessons.* Westport, CT: Praeger, 2003.

Corram, Robert. *Boyd: The Fighter Pilot Who Changed the Art of War.* New York: Back Bay Books, 2004.

Craighill, W. P., and G. H. Mendell. Translated by Baron de Jomini. *The Art of War.* Philadelphia: J. B. Lippincott & Co., 1862. Reprinted Westport, CT: Greenwood Press, 1971.

Dempsey, Martin. *Mission Command White Paper.* Washington, DC: Government Printing Office, 2012.

Du Picq, Ardant. *Battles Studies.* Project Gutenberg, 2005. Kindle edition.

Echevarria, Antulio Joseph. *Clausewitz and Contemporary War.* Oxford, UK: Oxford University Press, 2007.

———. "Clausewitz's Center of Gravity: It's Not What We Thought." *Naval War College Review* 55, no. 1 (2003).

———. "Principles of War or Principles of Battle?" In *Rethinking the Principles of War,* edited by Anthony D. McIvor. Annapolis, MD: Naval Institute Press, 2012.

———. *Reconsidering the American War of War*. Washington, DC: Georgetown University Press, 2014. Kindle edition.

Encyclopaedia Britannica online. "Entropy." https://www.britannica.com/science/entropy-physics.

Fehrenbach, T. R. *Fire and Blood: A History of Mexico.* New York: De Capo Press, 1995.

———. *This Kind of War.* Herndon, VA: Potomac Books, 2008.

Fick, N. C. *One Bullet Away: The Making of a Marine Officer.* Boston: Houghton Mifflin Harcourt, 2005.

Foch, Ferdinand. *The Principles of War.* Translated by J. De Morinni. New York: The H. K. Fly Company, 1918. First published 1903. Reprinted Middleton, DE: University of Michigan Library, 2016.

Frederick, Jim. *Black Hearts: One Platoon's Descent into Madness in Iraq's Triangle of Death.* New York: Broadway Books, 2011.

Freedman, Lawrence. *Strategy: A History.* Oxford, UK: Oxford University Press, 2013.

Friedman, Brett A., Ed. *21st Century Ellis: Operational Art and Strategic Prophecy for the Modern Era.* Annapolis, MD: Naval Institute Press, 2015.

———. "Blurred Lines: The Myth of Guerrilla Tactics." *Infinity Journal* 3, no. 4 (2014).

———. "Creeping Death: Clausewitz and Comprehensive Counterinsurgency." *Military Review* (January–February 2014).

Frost, Robert S. "The Growing Imperative to Adopt 'Flexibility' as an American Principle of War." U.S. Army War College Strategic Studies Institute, Carlisle, PA, 1999.

Fuller, J. F. C. *The Foundations of the Science of War.* Leavenworth, KS: U.S. Army Command and General Staff College Press, 1993. Original published 1926.

Goerlitz, Walter. *History of the German General Staff 1657–1945*. Lancaster, UK: Gazelle, 1995. Kindle edition.

Gordon, Craig A. "Delbrück: The Military Historian." In *Makers of Modern Strategy from Machiavelli to the Nuclear Age,* edited by Peter Paret. Princeton, NJ: Princeton University Press, 1986.

Grant, Ulysses S. *Personal Memoirs of U.S. Grant.* New York: De Capo Press, 1982. Original published 1885.

Gray, Colin S. *The Strategy Bridge: Theory for Practice.* Oxford, UK: Oxford University Press, 2010.

Griffith, Paddy. *Forward into Battle: Fighting Tactics from Waterloo to the Near Future.* New York: Ballantine Books, 1990.

Grossman, Dave, and Loren W. Christensen. *On Combat: The Psychology and Physiology of Deadly Conflict in War and Peace* (2nd ed.). United States of America: PPCT Research, 2007.

Gudmonsson, Bruce. *On Artillery.* Westport, CT: Praeger, 1993.

———. *Stormtroop Tactics: Innovation in the German Army, 1914–1918.* Westport, CT: Praeger, 1989.

Guevara, Ernesto. *Guerrilla Warfare.* Translated by J. P. Morray. Lexington, KY: BN Publishing, 2012. Original published 1961.

Hanson, Victor Davis. *Carnage and Culture.* New York: Random House, 2002.
———. *The Western Way of War: Infantry Battle in Classical Greece.* Berkeley: University of California Press, 1989.
———. *The Western Way of War: Infantry Battle in Classical Greece* (2nd ed.). Berkeley: University of California Press, 2000.
Hastings, Max. *Inferno: The World at War, 1939–1945.* New York: Alfred A. Knopf, 2011.
Hawking, Stephen. *The Illustrated A Brief History of Time: Updated and Expanded Edition.* New York: Bantam Books, 1996.
House, Christopher M. *Combined Arms Warfare in the Twentieth Century.* Lawrence: University of Kansas Press, 2001.
Hughes Jr., Wayne P. *Fleet Tactics and Coastal Combat*. Annapolis, MD: Naval Institute Press, 2000.
———. *The U.S. Naval Institute on Naval Tactics*. Annapolis, MD: Naval Institute Press, 2015.
Hutton, Brian G. [Director]. *Kelly's Heroes.* Metro–Goldwyn–Mayer, United States, 1970.
Joint Chiefs of Staff. *Doctrine for the Armed Forces of the United States.* Washington, DC: Joint Chiefs of Staff, 2013.
Jones, Dan. *The Plantagenets: The Warrior Kings and Queens Who Made England.* New York: Penguin, 2012.
———. *The Wars of the Roses: The Fall of the Plantagenets and the Rise of the Tudors*. New York: Penguin, 2014.
Jünger, Ernst. *Storm of Steel.* New York: Penguin, 2003.
Karnow, Stanley. *Vietnam: A History.* New York: The Viking Press, 1983.
Keegan, John, Ed. *The Book of War: 25 Centuries of Great War Writing.* New York: Penguin, 2000.
———. *The First World War.* New York: Knopf Doubleday, 1998.
Kelly, Justin, and Mike Brennan. *Alien: How Operational Art Devoured Strategy.* Carlisle, PA: U.S. Army War College Strategic Studies Institute, 2009.
Kennedy, Hugh. *The Great Arab Conquests: How the Spread of Islam Changed the World We Live In.* Philadelphia: De Capo Press, 2007.
Kilcullen, David. *Counterinsurgency.* Oxford, UK: Oxford University Press, 2010.

———. *Out of the Mountains: The Coming Age of the Urban Guerilla*. Oxford: Oxford University Press, 2013. Kindle edition.
Kissinger, Henry. "The Vietnam Negotiations." *Foreign Affairs* 48, no. 2 (January 1969).
Knights, Michael. "ISIL's Politico-Military Power in Iraq." *CTC Sentinel* 7, no. 8 (August 2014).
Leckie, Robert. *George Washington's War: The Sage of the American Revolution.* New York: Harper Collins, 1992.
Leonhard, Robert R. *The Principles of War for the Information Age.* Novato, CA: Presidio, 1998.
Liddell Hart, Sir Basil. *Strategy.* New York: Meridian, 1991.
Lind, William. *Maneuver Warfare Handbook.* Boulder, CO: Westview Press, 1985.
May, Timothy. *The Mongol Art of War.* Yardley, PA: Westholme, 2007.
McPherson, James M. *Battle Cry of Freedom: The Civil War Era*. New York: Oxford University Press, 1988. Kindle edition.
Meier, Christian. *Caesar: A Biography.* New York: Harper Collins, 1995.
Miles, Richard. *Carthage Must Be Destroyed: The Rise and Fall of an Ancient Civilization*. New York: Viking, 2011. Kindle edition.
Milevski, Lukas. "Revisiting J. C. Wylie's Dichotomy of Strategy: The Effects of Sequential and Cumulative Patterns of Operations." *Journal of Strategic Studies* 35, no. 2 (2012).
Millett, Allan R., and Williamson Murray, Eds. *Military Effectiveness Volume I: The First World War.* Boston: Unwin Hyman, 1988.
Moorehead, Alan. *Gallipoli.* New York: Perennial Classics, 2002.
Morris, Donald R. *The Washing of the Spears: A History of the Rise of the Zulu Nation under Shaka and Its Fall in the Zulu War of 1879.* New York: Simon and Schuster, 1965.
Morris, Marc. *The Norman Conquest: The Battle of Hastings and the Fall of Anglo-Saxon England.* New York: Pegasus Books, 2014. Audiobook. Narrator Frazer Douglas.
Murray, Williamson, and Allan R. Millett. *A War to Be Won: Fighting the Second World War.* Cambridge, MA: Belknap Press, 2000.
Naylor, Sean. *Relentless Strike: The Secret History of Joint Special Operations Command.* New York: Saint Martin's Press, 2015.

Oman, C. W. C., J. H. Beeler, and S. C. Oman. *The Art of War in the Middle Ages: AD 378–1515* (4th ed.). Ithaca, NY: Cornell University Press, 1960.

O'Reilly, Francis Augustin. *The Fredericksburg Campaign: Winter War on the Rappahannock.* Baton Rouge: Louisiana State University Press, 2006.

Owen, William. "The Operational Level of War Does Not Exist." *Journal of Military Operations* 1, no. 1 (Summer 2012).

Paret, Peter, *Clausewitz and the State.* Oxford, UK: Clarendon Press, 1976.

———. Ed. *Makers of Modern Strategy: From Machiavelli to the Nuclear Age.* Princeton, NJ: Princeton University Press, 1986.

Polybius. *Polybius: The Rise of the Roman Empire.* Translated by Ian Scott-Kilvert. New York: Penguin, 1979.

Pope, Dudley. *The Battle of the River Plate: The Hunt for the German Pocket Battleship Graf Spee.* Ithaca, NY: McBook Press, 2005.

Rabinovich, Abraham. "From Futuristic Whimsy to Naval Reality." *Naval History* 28, no. 3 (June 2014).

Rommel, Erwin. *Attacks.* Provo, UT: Athena Press, 1979.

Scales, Robert. "Adaptive Enemies: Achieving Victory by Avoiding Defeat." *Strategic Review* 27, no. 5 (Winter 1999).

Showalter, Dennis. *Hitler's Panzers: The Lightning Attacks That Revolutionized Warfare.* New York: Berkley Caliber, 2009.

Simpson, Emile. *War from the Ground Up: Twenty-First-Century Combat as Politics.* New York: Oxford University Press, 2013.

Smith, Rupert. *The Utility of Force: The Art of War in the Modern World.* New York: Knopf, 2007.

Spector, Ronald H. *Eagle against the Sun: The American War with Japan.* New York: The Free Press, 1985.

Staff of the U.S. Army Combat Studies Institute. "Wanat: Combat Action in Afghanistan, 2008." U.S. Army Combined Arms Center. Combined Studies Institute Press, 2010.

Storr, Jim. *The Human Face of War*. London: Continuum Books, 2009.

Strachan, Hew. *Clausewitz's* On War: *A Biography.* New York: Atlantic Monthly Press, 2007.

———. *The Direction of War: Contemporary Strategy in a Historical Perspective*. New York: Cambridge University Press, 2013. Kindle

edition.
Sumida, Jon Tetsuro. *Decoding Clausewitz: A New Approach to On War.* Lawrence: University Press of Kansas, 2008.
Sun Tzu. *The Art of War.* Translated by Samuel B. Griffith. Oxford, UK: Oxford University Press, 1963. Original published fifth century BC.
Tanner, Stephen. *Afghanistan: A Military History from Alexander the Great to the War against the Taliban.* New York: De Capo Press, 2009.
U.S. Army. *Army Doctrinal Reference Publication (ADRP): 3-90 Tactics.* Washington, DC: Government Printing Office, 2012.
———. *FM 3-24 Counterinsurgency*. Washington, DC: Government Printing Office, 2006.
———. *FM 3-90 Tactics.* Washington, DC: Government Printing Office, 2001.
U.S. Government. *Joint Publication 1-02 Department of Defense Dictionary of Military and Associated Terms*. Washington, DC: Government Printing Office, 2008.
———. *Joint Publication 2-01.3: Joint Intelligence Preparation of the Operational Environment.* Washington, DC: Government Printing Office, 2009.
U.S. Marine Corps. *Doctrinal Publication (MCDP): 1: Warfighting.* Washington, DC: Government Printing Office, 1995.
———. *Doctrinal Publication (MCDP): 1-0: Operations.* Washington, DC: Government Printing Office, 2011.
———. *Doctrinal Publication (MCDP): 4: Logistics.* Washington, DC: Government Printing Office, 1997.
Vego, Milan. *Joint Operational Warfare: Theory and Practice, Volume 1.* Digital. Washington, DC: Department of the Navy, 2009.
Warner, Denis, and Peggy Warner. *The Tide at Sunrise: A History of the Russo-Japanese War 1904–1905.* New York: Charterhouse, 1974.
Waters, S. D. *The Official History of New Zealand in the Second World War, 1939–1945.* Wellington: Royal New Zealand Navy, Historical Publications Branch, 1956. http://nzetc.victoria.ac.nz/tm/scholarly/tei-WH2Navy-c4.html.
Wedgwood, C. V. *The Thirty Years' War.* New York: New York Review Books, 1938.

West, F. J., and B. West. *No True Glory: Fallujah and the Struggle in Iraq: A Frontline Account.* New York: Random House, 2005.

Whitman, James Q. *The Verdict of Battle: The Law of Victory and the Making of Modern War.* Cambridge, MA: Harvard University Press, 2012.

Wilson, Andrew R. *Masters of War: History's Greatest Strategic Thinkers.* Newport, RI: U.S. Naval War College, 2013. Audiobook.

Wylie, J. C. *Military Strategy: A General Theory of Power Control.* Annapolis, MD: Naval Institute Press, 2014.

INDEX

"In this digital publication the page numbers have been removed from the index. Please use the search function of your e-Reading device to locate the terms listed."

adaptability
Adolphus, Gustavus
Afghanistan: Afghan forces; and counterinsurgency; guerrilla warfare; insurgency in; al Qaeda in; Taliban in; Tora Bora, Battle of; Wanat, Battle of
agoge
airpower: air support; and firepower; Khe Sanh, Battle of; Korean War; Luftwaffe; and maneuver; and shock effect; Stalingrad, Battle of; and tempo; 2003 Iraq War; World War II
Alexander the Great
ambush: as enemy-oriented task; and firepower; in French & Indian War; Hannibal's use of; insurgents use of; in Korean War; Mongol use of; NVA (North Vietnamese Army) use of; and surprise; Syracusan army use; tactical tenets of; timelessness of; underlying principles of
annihilation strategy: annihilation tactics; annihilation-exhaustion paradigm; *Niederwerfungsstrategie*; sequential-cumulative paradigm
archer use
armor: in ancient warfare; *cataphracts*; and chariots; and firepower; in Greek warfare; in Middle Ages; in Peloponnesian Wars; Roman use of; in Spanish conquest; Spartans use of. *See also* tanks
artillery: Civil War; as combined arms; disadvantages of; and fortifications; jumping barrage technique; Khe Sanh, Battle of; mental effects of; and Napoleon; and shock effect concept; as support; Vimeiro, Battle of; and WWI; and WWII
assessment
Assyrian Empire
asymmetry
attrition strategy: attrition/annihilation dichotomy; Boyd on; of Grant; and insurgency; and moral cohesion
Aufragstaktik/mission command
Austria
auxilia troops

battles: Austerlitz; Borodino; Breitenfeld; the Bulge; Bunker Hill; Cannae; Chancellorsville; Cold Harbor; Cowpens; Crécy; Dien Bien Phu; Fallujah; Fredricksburg; Gallipoli; Gaugameda; Gettysburg; Goose Green; Hastings; Hohenfriedberg; Jena-Aurstadt; Jutland; Kalka River; Khe

Sanh; Lake Trasimene; Leuctra; Leuthen; Liegnitz; Masada; Mohi Bridge; Monongahela; the Nile; Nineveh; North Anna; Orléans; Otumba; Pearl Harbor attack; Petersburg; River Plate; Sa'ari Steppe; Salamanca; Sphacteria; Stalingrad; Thermopylae; Tora Bora; Trafalgar; Trebia; Troy; Tsushima Strait; Vimeiro; Wanat; the Wilderness; Yorktown; Zama
bayonet charge
Biddle, Stephen
blitzkrieg
Boers/Boer War
Boyd, John: on cheng/ch'i concepts; friction concept; on moral cohesion; on politics; strategic theory of; on tempo; and *On War* (Clausewitz)
Braddock, Edward
Brasidas
British military: in Afghanistan; Boer War; British Royal Navy; Cowpens, Battle of; Crimean War; Falklands War; French & Indian War; Gallipoli, Battle of; in Iraq; leadership of; Peninsular War; Suez Canal crisis; Vimeiro, Battle of; Yorktown, Battle of
Bülow, Bernhard von
Burnside, Ambrose

Carthaginian army
cavalry: Charge of the Light Brigade; Cossacks; and deception; *equites* troops; Greek/Macedonian use of; in medieval warfare; shock effect of; *tercio* formation and
center of gravity: astrophysics; Athens; Clausewitz on; conclusions; current view of; defined; modern use of; Napoleon as; overview; physics vs. astrophysics; Stalingrad; Wylie's Coup
centralization/decentralization of command
Chandler, David
cheng/ch'i concepts
Chingis (Ghengis) Khan
Citino, Robert M.
Civil War: Appomattox; Confederate Army; offensive/defensive operations; Union troops. *See also under* battles; *specific officers*
Clausewitz, Carl von: center of gravity; on confusion; culminating point concept; defensive/offensive operations; on destruction; on doctrine; on flexibility; on friction; and Iraqi insurgents; on mass; misinterpretation of; on moral cohesion; nature of war; on numerical superiority; offensive/defensive operations; physics and astrophysics; politics and strategy; *Principles*; on Prussian training system; quotes; on surprise; on tactical warfare; tactics-strategy dichotomy; *On War*; war as contest of wills; Wylie comparison
cohesion
combat power
combined arms concept
command/control
communication
confusion
conscription/voluntarism
Continental Army
conventional/guerilla warfare: Clausewitz on strategic offense/defense; Delbrück on attrition/annihilation; Kissinger on; and mitigation; overview; strategic symmetry/asymmetry; Vietnam War; Wylie on sequential/cumulative

corps system
counterinsurgency
cover and concealment
“crossing the T” naval tactic
culminating point concept
cyber warfare

decentralization/centralization of command
deception; defined; Korean War; as mental tenet; Napoleon’s diplomatic; and surprise; and tacticians
defense in depth tactics
defensive/offensive operations
Delbrück, Hans
direct/indirect approach
dispersal tactics
distributed lethality concept
doctrine: Clausewitz, on; and counterinsurgency; of U.S. Army; of U.S. Marine Corps
Du Picq, Ardant
duty

Echevarria, Antulio J.
economy
effects-based operations
Egyptian forces
Einheit (unity), and center of gravity
electronic warfare
Ellis, Earl “Pete”
entropy concept
environment/geography; ground types; in Korean War; mastery of terrain; in Napoleonic wars; Sun Tzu on
Epaminondas of Thebes
equites troops
Ermattungsstrategie/annihilation strategy
esprit de corps
ethics
exhaustion strategy: annihilation-exhaustion paradigm; *Ermattungsstrategie*; exhaustion tactics; sequential-cumulative paradigm

firepower: in Afghanistan; and airpower; and ambush; in ancient warfare; and combined arms; defined; and dispersal; distributed lethality concept and; Germans use of; interlocking; in Korean War; and maneuver; and mass; mental effects of; in Middle Ages; missile weapons; and mitigation; in modern warfare; Mongol use of; panzer corps; as physical tenet; and shock effect; and symbiosis; and tacticians; and trenches; use of; in WWI; in WWII
flanking attack: Breitenfeld, Battle of; Confederate use of; and deception; in Falklands War; Frederick the Great’s use of; Greek use of; Guevara’s use of; and infiltration; Jomini on; Korean War; Mongols use of; Napoleon’s use of; and phalanx formation; and surprise; tactic and technique; 2003 Iraq War; Union use of; Vimeiro, Battle of; in WWI

flexibility: Alexander the Great and; in defense operations; and leadership; and logistics; as planning principle; of Roman army; in warfare
fluidity/chaos component
Foch, Ferdinand
formations: charging bull formation; checkerboard pattern formation; column formation; phalanx formation; *tercio* formation
fortifications
Frederick, Jim
Frederick the Great
Freedman, Lawrence
French and Indian War
French military: Charles VI; Dien Bien Phu, Battle of; French navy; leadership of; and mental effects; and moral cohesion; Napoleonic Corps; Suez Canal crisis; Vimeiro, Battle of. *See also* French & Indian War; Napoleon I; Napoleonic Wars
friction concept
Fuller, J. F. C.

Germany/German military: blitzkrieg; in Czechoslovakia; German navy; goals of; howitzer use; infiltration tactics; and mitigation; Operation Autumn Mist; poison gas use; and Red Army; shock troops; Stalingrad, Battle of; tactical success of; and Turks. *See also* Hitler, Adolf
Grant, Ulysses S.
Gray, Colin S.
Greeks/Greek warfare: Athens; *diekplous* maneuver; Greek fleet; *helots*; hoplites; *The Iliad*; Leuctra, Battle of; Peloponnesian Wars; phalanx formation; Philip II of Macedon. *See also* Alexander the Great; Spartans
Guderian, Heinz
Gudmonsson, Bruce
guerrilla warfare
Gulf War

Hannibal
hastati troops
helots
Hitler, Adolf: Operation Autumn Mist; Operation Blue; Operation Uranus; and panzer division; and Red Army; Stalingrad, Battle of
hoplites: chanting of; defined; as freeman; Leuctra, Battle of; phalanx formation; Roman comparison; Sphacteria, Battle of; Thermopylae, Battle of; training
hoplon
Hughes, Wayne P., Jr.
Hundred Years' War
Hungarian army
Hussein, Saddam

indirect/direct approach
infiltration tactics
information assurance concept
initiative concept

innovations
insurgents/insurgency
intelligence
interdependence (*Zusammenhang*)
Iraq/Iraqi army: and counterinsurgency; environment/geography; guerrilla warfare; Hussein, Saddam; Iraqi Civil War; ISIS in; and politics; U.S. 2003 invasion of. *See also* 2003 Iraq War
Israeli military

Jackson, Stonewall (Thomas Jonathan)
Japanese military: Japanese aerial attacks; Japanese army; Japanese navy; Togo, Heihachiro
Joan of Arc
Jomini, Antoine Henri
Jugurthine War
Julius Caesar
jumping barrage technique
Jünger, Ernst
jus ad bellum/*jus in bello* terms
Keegan, John
Korean War

leadership: centralization/decentralization of command; commander intent; consuls; education; and flexibility; Kemal, Mustafa; and moral cohesion; and policy; subordinate commanders; and tempo
Lee, Robert E.
Leonhard, Robert
Liddell Hart, Basil
limitation
Lin Paio
Lind, William
logistics
Luftwaffe

MacArthur, Douglas
Macedonians
Machiavelli, Niccolò
main effort/*Schwerpun*
maneuver; defense against; defined; *diekplous* maneuver; double envelopment maneuver; envelopment; envelopment maneuver; and firepower; flanking attack; forms of; Frederick the Great's use of; frontal attacks and; infiltration; Iraq War (2003); Macedonian use of; *manoevre de derrière*; in medieval warfare; Mongols use of; Napoleon's use of; outmaneuvering; phalanx formation; as physical tenet; and strategy; swarming maneuver; and symbiosis; and tacticians; Tet Offensive; turning movement. *See also* outmaneuvering
Manstein, Erich von
Mao Zedong (Tse-Tung)
maskirovka concept
mass; Clausewitz on; defined; and economy; and firepower; Frederick the Great's use of; Germans use of; Grant's use of; jumping barrage technique; Leuctra, Battle of; Mongol use of; phalanx formation; as physical tenet; and shock effect; and symbiosis; and tacticians

mental tenets: combating; deception; long lasting effects of; shock effect concept; surprise; and tacticians
mercenaries
Milevski, Lukas
mission command/*Aufragstaktik*
mitigation: and environment/geography; and firepower; and friction; and human factors; and leadership; and mental effects; and mission command; and tempo
Mongols: deception use; and gunpowder; horse archers; mixed forces of; Mohi Bridge, Battle of; organization of; politics of
moral cohesion; defined; ethics; in Korean War; leadership; loss of; as moral tenet; morale comparison; morality; Napoleon and; power of; Storr on; and tactical victory; voluntarism/conscription
morale: as binding factor; and cohesion; defined; and moral cohesion; Napoleon and; of Red Army
Morgan, Daniel

Napoleon I: attrition vs. annihilation strategies; Borodino, Battle of; as cause of Napoleonic Wars; as center of gravity; corps system of; deception tactics; dispersal tactics of; maneuver tactics of; mastery of terrain; Peninsular Wars; principles of war; quote; and Spain; Trafalgar, Battle of; and troop morale; Waterloo
Niederwerfungsstrategie/exhaustion strategy
Norman Invasion
North Vietnamese Army (NVA)

oblique order tactic
offensive/defensive operations
On War (Clausewitz)
Operation Desert Shield/Storm. *See* Gulf War
Operation Iraqi Freedom. *See* 2003 Iraq War
Operation Uranus
operational art
operational level of war
operational security concept
organization of militaries: Assyrian Empire; current; Macedonians; Mongol Horde; Napoleonic Corps; panzer division; Roman Legion; units

Pakistan
panzer corps
Paret, Peter
Patton, George
Paulus, Friedrich
Peloponnesian Wars
peltasts
Persians/Persian Wars: *cataphracts*; conscription/voluntarism; Darius III; horse archers; Persian fleet; Thermopylae, Battle of; Xerxes
Philip II of Macedon
Philippines

planning principles: communication; conclusions; economy; flexibility; overview; simplicity; time; unity
policy: defined; Mongols; and operational levels; and strategy; and tactics
politics: Boyd on; Bush administration; and center of gravity; Clausewitz on; and insurgency; and point of culmination; Roman army; and strategy; and victory; and Vietnam War
principes troops
probability/chance
proportional force
Prussia/Prussian army
Punic Wars
al Qaeda

Red Army: Delbrück dichotomy and; *maskirovka* concept; Moscow defense; Operation Mars; Operation Uranus; outmaneuvered; Stalingrad, Battle of; use of mass
reserve: in charging bull formation; command/control pillar; defined; and economy; Napoleon I; Roman army; Stalingrad, Battle of
riarii troops
Roman military: and cohesion; combined arms; and Hannibal; Julius Caesar; Masada, siege of; Mongol comparison; Punic Wars; Roman navy; success of; voluntarism/conscription
Romanian army
Rommel, Erwin
Russian/Soviet military. *See also* Red Army
Russo-Japanese War

Scales, Robert
Schwerpunkt/main effort
Scipio, Publius Cornelius
sequential-cumulative paradigm. *See also* annihilation strategy
Sherman, William T.
shock effect concept; and airstrikes; of bayonet charge; of bombardment; of cavalry charge; defined; mental effects of; as mental tenet; and tacticians; of tanks
siege warfare
simplicity
Soviet Union. *See also* Red Army
Spain/Spanish infantry
Spartans/Sparta: *agoge*; and Athens; Brasidas; and cavalry/light infantry; chanting of; comparisons to; freemen warriors; *helots*; Leuctra, Battle of; and maneuver; and missile weapons; Peloponnesian Wars; Sphacteria, Battle of; tactics of; Thermopylae, Battle of. *See also hoplites*
Stalin, Joseph
Storr, Jim
Strachan, Hew
strategy: as a bridge; defined; indirect/direct approach; and policy; and politics; strategic symmetry/asymmetry; strategic theory; and tactics
subordinate commanders
Suez Canal crisis
Sumida, Jon Tetsuro

Sun Tzu: *The Art of War*; Boyd comparison; on center of gravity; cheng/ch'i concepts; on combinations; on command style; on confusion; on deception; quotes; on strategy; terminology of; on terrain
surprise; and ambush; and confusion; and culminating point of victory; defined; Fredrick the Great and; Fuller on; and guerilla warfare; Hastings, Battle of; Korean War; Mao Zedong (Tse-Tung) and; as mental tenet; Napoleon and; Nelson and; as offensive action; Operation Autumn Mist; Roman army and; and shock effect; and special operations forces; and success; and tacticians; in WWII

tempo; and combined arms units; control of; defined; and guerilla warfare; and leadership; and maneuver; Mao Zedong (Tse-Tung) and; and mission command; and Mongols; and offense; and panzer corps; as physical tenet; and Roman army; and simplicity; and special operations forces; and symbiosis; and tacticians; understanding of; and victory
terrorist groups: and human shields; in Iraq; ISIS (Islamic State of Iraq and al-Sham); al Qaeda; strategy against; Taliban
Tet Offensive
Thucydides
time: and defense; demands of; and insurgency; and leadership; and mental effects; as planning principle; sequential-cumulative paradigm; and surprise; tempo; timeliness of actions; as a weapon
training/education; German system of; lack of; Lind on; and military history; and simplicity; of troops
trench warfare
triarii
Tse-Tung (Mao Zedong)
Turkey
2003 Iraq War: ambush; deception; environment/geography; Iraqi incompetence in; maneuver tactics; mental tenets; numerical superiority; Operation Iraqi Freedom; and political aftermath; political results of; U.S. invasion; U.S. military performance

unity (*Einheit*): in astrophysics analogy; and center of gravity; of command; and commander intent; and decentralization; derivation of; of Nazi Germany; as planning principle; in Rome
U.S. Air Force
U.S. Army: Army Brigade Combat Teams; Army War College; Center for Army Lessons Learned; Eighth Army; Leonhard on; National Training Center; offensive/defensive operations; operational planning; procedures of; and shock effect; training; Training and Doctrine Command; War College Strategic Studies Institute
U.S. Joint Special Operations Command (JSOC)
U.S. Marine Corps: Center for Lessons Learned; command style; culminating point concept; doctrine of; initiative concept; Iraq War (2003); at Khe Sanh; Korean War; Marine Air Ground Task Force; morale; operational planning; procedures of; at Saipan; and shock effect; Tora Bora, Battle of; training; Training and Education Command; WW II
U.S. Navy

velites troops
Vietnam War: guerrilla warfare; and politics; strategy of exhaustion; Tet Offensive; Viet Cong forces. *See also under* battles; North Vietnamese Army (NVA)

Walker, Walton W.
war crimes
Washington, George
weapon(s): atlatl; automatic; biological; bows; *cataphracts*; catapults; chariots; chemical; combined arms; confusion as; corps system as; crew-served; deception as; drones; elephants; friction as; gunpowder; howitzers; human shields; in Iraq; maneuver as; missile weapons; moral power as; nuclear; ranged; shields; siege warfare; spears; stirrup; swords; systems; tanks; technology of; tempo as; time as; training. *See also* combined arms concept; panzer corps
Wehrmacht
Whitman, James Q.
World War I: effects on maneuver tactics; exhaustion (cumulative) strategy; and firepower; poison gas use; tanks; trench use
World War II: Allied troops; Axis troops; and camouflage; and center of gravity; Eastern front; *maskirovka* concept; shock effect concept; Wake Island. *See also under* battles; German army; Red Army
Wylie, J. C.: on Clausewitz; *Military Strategy*; quotes; sequential-cumulative paradigm

Xerxes

ABOUT THE AUTHOR

B. A. Friedman grew up in Cleveland, Ohio, and entered the Marine Corps after graduating from high school in 2000. He attended The Ohio State University and earned a BA in history, as well as the Naval War College, where he earned an MA in national security and strategic studies. He transitioned to the Marine Corps Reserve in 2016 as a captain.

The Naval Institute Press is the book-publishing arm of the U.S. Naval Institute, a private, nonprofit, membership society for sea service professionals and others who share an interest in naval and maritime affairs. Established in 1873 at the U.S. Naval Academy in Annapolis, Maryland, where its offices remain today, the Naval Institute has members worldwide.

Members of the Naval Institute support the education programs of the society and receive the influential monthly magazine *Proceedings* or the colorful bimonthly magazine *Naval History* and discounts on fine nautical prints and on ship and aircraft photos. They also have access to the transcripts of the Institute's Oral History Program and get discounted admission to any of the Institute-sponsored seminars offered around the country.

The Naval Institute's book-publishing program, begun in 1898 with basic guides to naval practices, has broadened its scope to include books of more general interest. Now the Naval Institute Press publishes about seventy titles each year, ranging from how-to books on boating and navigation to battle histories, biographies, ship and aircraft guides, and novels. Institute members receive significant discounts on the Press' more than eight hundred books in print.

Full-time students are eligible for special half-price membership rates. Life memberships are also available.

For a free catalog describing Naval Institute Press books currently available, and for further information about joining the U.S. Naval Institute, please write to:

Member Services
U.S. NAVAL INSTITUTE
291 Wood Road
Annapolis, MD 21402-5034
Telephone: (800) 233-8764
Fax: (410) 571-1703
Web address: www.usni.org